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ANOTHER application of electromotive force to mining purposes on a large scale is in contemplation in this country. The Humboldt Electric Power and Mining Company has been formed in London to purchase certain mining claims from the Consolidated Esmeralda Company in the Durand Hill district, Aurora County, Nevada, and it is proposed to transmit 200 h. p. from a point distant from where the mill is to be erected by electricity. It will be generated by water power, and a portion of it will be supplied to the Consolidated Esmeralda Company.

A BILL was passed in the Vermont legislature this week to incorporate the Maritime Canal Company of Nicaragua. The act of incorporation is identical with that passed by the United States Senate, and is a precautionary step on the part of the promoters of the enterprise to avoid the consequences of any further possible delay should the bill now before Congress not become law, on the re-assembling of that body. It was stated before the joint legislative committee appointed to examine the bill that the final survey was completed, that over $300,000 had been expended in preliminary work, and that so soon as the organization of the company would permit construction work would be commenced.

IN our issue of October 6th we drew attention to the improved conditions under which the mining industries of this country are now working compared to those existing eight or ten years ago. We have a striking illustration of this in the new schedule agreed upon by the Colorado railroads. The new rates went into effect on the 5th inst., and the reduction in the charge for carrying bullion between Leadville and Denver, Colorado Springs and Pueblo, amounts to $2 a ton, and for coke $2 a ton, the new rates being $8 for bullion and coke in place of $10. The ore rates remain the same, viz., $4.70. Last spring the rates were $12 for bullion, $12 for coke, $7 for coal and $5 for ore The coal rate is now reduced to $5. This is a substantial relief to the smelters, in which, naturally, the miners participate, as the smelters can now afford to give them better prices for their ore.

THE ENGINEERING AND MINING JOURNAL is always pleased to be of service to its esteemed contemporaries in furnishing them interesting matter for their columns, but honesty and courtesy require that they should acknowledge in their columns the source from which the matter is taken. Last week the *Age of Steel*, which prides itself on being established in the year 1857, and therefore is old enough to know better, republishes no less than two editorials and an article from the ENGINEERING AND MINING JOURNAL without a word of credit—one on the Hydraulic Transmission of Power in London, one on Steel vs. Timber in Mines and Railroad ties, and still another on the profits of the Rio Tinto mine and the difference between private and government management. This is highly complimentary to us, though very discreditable to our contemporary; and we would suggest that if it continues this practice of taking our editorials without credit, it at least change the spelling of its name, that all who see it may know what to expect.

STEEL VS. TIMBER FOR RAILROAD TIES.

We notice in our foreign exchanges a notification from the Minister of Public Works for the republic of Chili that he is prepared to receive tenders for the supply of 739,400 iron or steel railroad ties 2·75 meters long, and 725,100 of 1·30 meters. This, along with the fact of recent large contracts entered into for the Argentine Republic, and one, at least, for Mexico, in all of which steel ties were stipulated for, shows what progress the substitution of iron or steel for timber is making in other countries. Here we are glad to learn that the New York Central Railroad is going to give the system a trial, and has ordered 800 steel ties to be put down on the Harlem road. If we are to judge from the experience of the railways in foreign countries, the New York Central and other of our leading railroads will soon find that although the first cost is somewhat higher, the economy of durability will more than compensate the increased outlay.

We fear that our steel makers are not yet in a position to compete for the supply of these metal ties to the Chilian government, nor yet for the 51,000 tons of steel rails also required there; but our locomotive and car builders may well tender for the 69 locomotives, 108 passenger cars and 924 freight cars that are called for, American rolling stock being deservedly popular in Chili, as in other countries where introduced. Our steel makers and railroad men may convince our railroad managers of the advantages metal ties offer, and once the industry is established, we have no doubt the cost of production here will be reduced to a point that will enable us to export at all events to nearby countries.

The adoption of metal ties would benefit not only the steel industry, but would save our forests for other purposes, and indirectly benefit both our mining and agricultural industries by not impairing the existing rainfall and keeping down the cost of timber.

VICTORIA, AUSTRALIA, GOLD MINING STATISTICS.

We have received the Report of the Secretary for Mines for Victoria Australia, for the quarter ending 30th June, 1888, which may be summarized as follows: The yield of gold was 150,193 Troy ounces, which shows a falling off, as compared with the preceding quarter, of 6624 ounces. This is accounted for by the severity of the winter, which impeded mining operations in certain localities, and by the "boom" in silver mining and suburban real estate, which has diverted capital from the gold mining industry. The dividends paid by mining companies amounted to £117,214, exclusive of dividends paid by a few private companies, which declined to furnish returns. The total quantity of quartz crushed, as reported to the mining registrars, was 182,560 tons, the average yield being 9 pennyweights 8·79 grains per ton. The highest average of any district was 1 ounce 19·63 grains, and the lowest 6 pennyweights 23·73 grains. The area of auriferous ground actually worked upon is 324¼ square miles, being an increase of 11 square miles over the area reported in the previous quarter. The mining population of the colony is given as 25,679, showing a small decrease, and this number of miners is nearly equally divided between quartz and alluvial mining. Of this number, 3980 are Chinese. The deepest shaft is 2409 feet, and there are nine others between that depth and 1920 feet. These deep shafts are, with one exception, in the same district. The value of the machinery is placed at £1,815,731. In the geological survey report in one district, the fusible nature of the volanic rock or lava is remarked upon, as it fuses readily in an ordinary

fire, and a suggestion is made that this property of the rock might be turned to some useful purpose. The registrar, who has charge of the district in which most of the Chinese are engaged in alluvial work, reports that there exists much ill-feeling against them on account of their constant ditch robbing and thieving propensities generally, and he looks upon their presence as a detriment to the mining interests.

THE ENGLISH SALT TRUST.

STORMS are quickly gathering around the head of the newly formed Salt Trust in England. We learn from our exchanges that the well-known firm of BRUNNER, MOND & CO., the only brine pumpers of importance left out of the "deal," and which is one of the largest chemical manufacturing concerns in the world, has now discovered a supply of brine at Anderton from which it is calculated that 250,000 tons of salt can be made per annum, and this it proposes to work in opposition to the trust. Already a strike has taken place among the salt workers, according to one account, because the men thought, not unreasonably, that they were entitled to consideration and a small share of the enormous advance made in selling prices by the trust.

From another account it would appear that the trust, like a giant, tyrannous in his strength, and blind to his own permanent interests, has actually reduced the wages of the workers. However, for the present the strike has apparently collapsed from want of organization. This is not likely to be long wanting, and in addition it looks as if the agitation will receive political support, as Mr. CHARLES BRADLAUGH, the labor M.P., and other Gladstonian members, are in the district forming trades unions. It happens that Mr. BRUNNER, of the firm above mentioned, is the Gladstonian member of Parliament for Northwich, and those in the trust are said to be mostly Conservatives and Liberal-Unionists. The following advertisement has also appeared in the leading London papers, which shows that organized resistance to the objects of the trusts is on foot, and that the legality of the combination will be tested:

"The Anti-Salt Monopoly League has been formed for the purpose of defeating the recent scheme of the Salt Union, Limited, monopolizing the salt trade, and thereby creating an artificial rise in the price of one of the first necessities of life.

"Counsel's opinion has been taken, and is to the effect that the scheme is unlawful.

"Those who sympathize with the purposes of this League are requested to signify their approval and adhesion to this movement by letters addressed to this office, or in person, between the hours of 12 and 3.

"This will not involve any pecuniary responsibility whatever, as the necessary funds for all purposes (including the legal steps to be taken) have been fully provided for. F. CLARK, Secretary.

"Offices of the League: 15 Cockspur street, Charing Cross, S. W."

We follow with much interest the career of this trust as, apart from the important bearing its success or failure will have upon some of our industries, it will teach an instructive lesson to those in this country who may be inclined to regulate markets by similar means. The Sugar Trust, with headquarters in this city, has already fallen into the meshes of the law, and actions have been commenced by the Attorneys-General of the States of California and New York looking to the annulment of some of the charters under which its component companies exist. We do not believe that trusts which, like this English copy of our Standard Oil trust, greatly and beyond reason increase the price of necessary articles of general consumption, can long survive in the atmosphere of this country.

THE EXCELSIOR COPPER MINES.

It is notorious that London investors are almost always imposed upon in the mining schemes that are offered to them. We are not at all surprised, therefore, when we see some new bubble inflated there, and cannot undertake to prick them all. Occasionally a mine of which we may have personal knowledge or concerning which we have indubitable expert evidence, attracts particular attention, and we expose it, and if such London papers as the *Economist*, the *Financial News*, or the *Financial Times*, join in, the scheme is defeated, only, however, to make way for some new fraud.

A certain West Indian gold mining company, in London, which has mines in Santo Domingo, is one of the schemes that will inevitably end in utter loss. The property had been thoroughly tested and reported on by competent experts, and its worthlessness fully demonstrated long before it was taken to London. Nevertheless it floats readily in the heavy atmosphere of that paradise of promoters.

The latest bubble that has attracted our attention is the Excelsior Copper Company, so named, perhaps, with the expectation that owing to its extreme levity it will "go up."

This scheme differs from many of the London mining "bubbles," which are for the most part undeveloped and leave room for a vast amount of imagination in figuring up impossible profits. This property, which consists of copper mines and is situated near West Broughton, in the Province of Quebec, has been worked quite extensively, and under the administration of some of our most experienced mining engineers and metallurgists it succeeded in swallowing up more than one fortune.

There is no lack of reliable information available concerning the property and its lack of value, and any one interested in the subject can get unimpeachable expert testimony concerning it. On the other hand, the promoters parade rich samples and some ancient history in the form of opinions expressed by experts before the mines were opened, and they give also a very extraordinary report by Mr. OBALSKI, "Government Mining Engineer of the Province of Quebec," which will certainly bring no credit to him or to the Government whose commission he bears.

There is also a report by Col. J. DREW GAY, a *war correspondent and traveler*—who evidently is not an engineer, much less a mining engineer. The editor of a Montreal financial paper also makes a brief report, and asserts, with the sublime confidence which is characteristic of total ignorance of a subject, that there are "vast bodies of the richest copper ore in existence in these mines," and that "a splendid return is assured."

The Excelsior Copper Company pays for the property £400,000, or $2,000,000. Among the many experts who know the value of the property it is doubtful if any one would be found willing to pay five per cent of this price for the property. Indeed, not long ago it is said it could have been purchased for much less than this.

It is true some very rich ore is found in the mine, but no quantity which would make a profitable mine has ever been opened; and the whole scheme is condemned in unmeasured terms by those acquainted with it and with some of its promoters.

FUEL OIL AS A SUBSTITUTE FOR COAL.

Through the courtesy of Mr. E. C. POTTER, Vice President of the North Chicago Rolling Mill Company, we are enabled to place before our readers conclusive figures with regard to the relative economy of crude oil and coal as fuel for boiler heating purposes. The scale on which the trial has been made is sufficiently extensive to remove the question from the experimental to the practical stage.

In reply to many inquiries addressed to Mr. POTTER for the results obtained in the use of fuel oil, that gentleman informs us, for the general benefit of those interested in the subject, that in their South Chicago works they have a battery of fourteen boilers in the converting department operated with fuel oil supplied through the medium of the Reid burner, and that the returns for October show that the consumption of oil, as compared with the coal consumption under the same boilers, is that 3 6 barrels of 42 gallons each, or 151·2 gallons, does the work of one ton of Indiana block coal. The cost of the oil is slightly under the cost of the coal. The great saving in the use of the new fuel is found in the saving of labor for stoking, for wheeling out ashes, and for unloading coal. When using coal, twenty-five men were required to operate this battery of boilers for twenty-four hours, while with the use of oil four men accomplish the same work. Consequently considerable saving in the cost per ton of ingots turned out of this department is effected by this improvement.

The efficiency of the battery of boilers is materially increased, and the cost of maintenance is very materially lessened, as the oil flame seems to be much less severe upon the metal than that of coal. There is practically no smoke, no ashes, no dust or dirt of any kind. The odor of oil is so slight as to be scarcely appreciable; the oil fuel is clean, easily handled and in every way thoroughly satisfactory, and for raising steam is second only in Mr. POTTER'S opinion to natural gas. As a final proof of the results obtained in this large establishment, which is a model of efficient and economical management, it is intended to equip the entire plant at the earliest possible date with oil as fuel for steam raising. From this high endorsement, it is evident that under similar conditions the use of oil fuel is to be advocated and adopted, though how far general adoption would increase the price beyond the economical limit is not yet clear.

On the same subject a correspondent of the *Electrical World* writes as follows:

The Detroit Steel Spring Works have used petroleum for eighteen months under eight boilers of 95 horse-power each, as well as in their furnaces for heating steel. The following figures refer only to the boilers, six being used at a time. They burned 24 tons of the best bituminous coal every 24 hours, and were often short of steam. The coal cost $2.80 per ton, and the labor, including the removal of ashes, made the total expenditure per day (twenty four hours), $80.25. The consumption of petroleum for the same period of time is 76 barrels of 42 gallons each, at a cost of 55 cents per barrel, the total cost, including labor, being $45.30 per day (twenty-four hours), a saving of $34.90, equal to 41 per cent. They have an abundance of steam, and always under a constant pressure. The arrangement of the furnaces was designed by H. Barr, the Superintendent of the works. The result obtained in the heating furnaces has been equally satisfactory.

CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

All letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

High Fire Test Petroleum Oil.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The appeal made in your issue of 13th October for higher temperature tests for illuminating oil reminds me of a favorite axiom of my regretted friend Professor J. Lawrence Smith, of Louisville, Ky. "Naphtha," he used to say, when he came to my laboratory, "is more

dangerous than powder, because the gases of naphtha fetch fire, while fire must be brought to powder."

This question of high temperature tests has for many years occupied much of my time, and you can by calling on Professor Chandler, of New York, see my fire tester, approved on account of its simplicity and severity of indications by several countries of Europe as the official instrument for testing mineral oils.

You are quite right, Mr. Editor, to insist upon high fire test, because it can be very easily obtained. For instance, by my process (and many others may be just as effective), petroleum is rendered quite odorless, and if not quite inexplosive, at least, so deprived of its excessive volatility, that the burning oil is turned into almost a fixed oil, for when it is left standing in an open vessel for some days it scarcely loses any of its volume by evaporation. It is, therefore, perfectly safe, can be handled close to a flame or be burnt in any kind of lamp without the least danger of explosion. Even gasolene can thus be rendered odorless and relatively less volatile.

As a consequence of this alteration, no excessive pressure of vapors generate inside of the lamp while it is burning; therefore the feeding of the wick is normal, the flame white and steady, and the combustion of the gases more complete.

But although greatly deprived of its volatility by this treatment, the illuminating oil retains one of the most important qualities of petroleum, viz., its property of ascending by the mere capillarity of the wick from the bottom of the lamp to the burner without the help of any spring or contrivance.

Those conditions of simplicity and cheapness united to great intensity of flame, by placing within reach of the working classes a powerful, portable and ready light, have constituted petroleum one of the most effective agents of civilization of the nineteenth century. It has become almost as indispensable as bread, therefore all our efforts ought to tend towards improving that wonderful product in point of safety and salubrity.

For my part I can certify that it does not now necessarily cost more to the manufacturer to obtain a safe, odorless illuminating oil of 120° F. flashing point than to produce by the old system a strong smelling oil flashing under 80° F.

As a conclusion let me add that I have lately succeeded in suppressing completely the very offensive, penetrating and persisting smell of the crude petroleum of Lima (Ohio) oil. I find that oil very valuable for illuminating purposes, as it can be brought up to very high temperature test.

WYOMING, Oct. 29, 1888. EMILE GRANIER.

FREDERIC A. POTTS.

It is not given to many to so completely round out a career as did our friend who was buried on Tuesday last in the comparatively short space of time allotted to him.

We approach the task of writing this memorial, full of affectionate earnestness and honest admiration. Endowed by nature with strikingly handsome physical proportions—his mental equipment and poise were in perfect keeping—large-brained, large-hearted; broad of comprehension, full of generous sympathy, and catholic in spirit, he was a loyal Christian gentleman. The world is better for his having lived.

FREDERIC A. POTTS has left a gap in the business circles which he adorned that may not speedily be filled. The proud position he achieved in his various spheres of usefulness in the coal trade, railroading, banking, and in the field of politics was not the result of accident or chance, but the legitimate fruit of a life of hard work, patient industry, and indomitable will, subordinated to an inflexible moral purpose. Mr. POTTS did not trifle with the work he had in hand. He entered the arena of every-day life equipped for battle, and he fought for success hard and long, but

FREDERIC A. POTTS.

with unimpeachable methods, giving no foul blows, taking no dishonorable advantage, and commanding success by the impetuosity of his manhood.

As his friend Mr. HOLDEN said in his touching eulogy, "He could not help succeeding. His success was simply the assertion of the forces and high qualities within him." How fondly we remember his cheery countenance, his frank and cordial manner; thoroughly approachable, yet hedged about with a gentle dignity which none might break through.

His death has caused genuine and universal regret to all who knew him. Mr. POTTS was connected with the coal trade all his life. He was born at Pottsville, Pa., in 1836, and at an early age came to New York and entered the employ of LEWIS AUDENRIED & Co., then a leading house in the trade, and of which his father was a partner. Upon the dissolution of the old firm, he succeeded to the business, which he greatly enlarged and carried on for a number of years under his individual name, finally taking into partnership several of his salesmen, and constituting the firm of FREDERIC A. POTTS & Co. Of late years the practical details of his coal business were largely left to his younger associates, his personal attention being required in the management of his numerous other enterprises. He was President of the New York, Susquehanna & Western Railroad Company, Vice-President of the National Park Bank, and a director in various other corporations. Mr. POTTS came of sturdy

stock, his ancestors having been Quakers, from whom he inherited his sterling qualities. He has passed away at the early age of 53, not ripe in years, but full of honors—having achieved a distinguished success in life, and leaving behind him a name which will be cherished and honored. At a meeting of the Coal Trade on Monday appropriate resolutions were adopted and addresses made. During the time of the funeral on Tuesday all offices were closed and business suspended, the entire trade attending the funeral services in a body.

IRRIGATION IN THE UNITED STATES.

We take the following interesting and instructive article from our excellent contemporary *The Nation*:

In the United States irrigation is employed extensively in Colorado, Utah and California. Colorado has by far the greatest irrigable area, and there the laws respecting the use of water for agriculture are the most perfect. Nature seems to have ordained that this State shall lead in irrigation. Within its borders are congregated the highest ranges and peaks of the Rocky Mountains; it is the veritable Dome of the Continent. On the countless square miles of its lofty summits fall the heaviest mantles of snow, the sources of an unfailing water supply. All the great rivers west of the Missouri, except the Columbia, commence their courses in this State. The Platte, the Arkansas, the Rio Grande and the Colorado rise nearly together in central Colorado, and in summer are large, swollen rivers before they leave its confines. No western state or territory, therefore, is nearly so abundantly supplied with water and streams as Colorado. This advantage, together with its favorableness of location with respect to immigration, and its vast extent of most fertile farming land, assures to it the foremost rank in agriculture among the mountain states.

The canal system of Colorado at this time embraces 5000 linear miles of large and small ditches. It represents investments of private capital amounting to $12,000,000, and furnishes water for two and a half millions of acres. So attractive are canal enterprises to those familiar with them that many miles of canals are now being constructed, notwithstanding the fact that there are at this time fully one million of acres of fine, unoccupied and unimproved land situate in the irrigated territory. The young State needs people rather than reservoirs and more canals.

The water of every natural stream is declared by the Constitution of Colorado the property of the public, and is dedicated to the people's use. There are no riparian rights. The canals are taken out of the rivers and creeks, and at present furnish water only for valley lands. The fertile plain-ranges and smooth *mesa*- or table-lands lie above the level of the streams, and must eventually be supplied with water by great and costly systems of reservoirs. When all the water of a stream is claimed and appropriated by ditches, it becomes a source of contention among its users, and the law is active in determining and enforcing the rights of the respective canal companies. The law is based on the principle that the right to water is acquired by priority of utilization; that is to say, the courts hold that water should not be taken away from those who first have utilized it in good faith. If, for instance, a canal has used the full capacity of a stream, it is forever entitled to all the waters of that stream. The volume of a river from which several canals are conducted having been estimated in cubic feet per second * of time by the State Engineer, each ditch company appears before the district court, which has jurisdiction subject to appeal to the Supreme Court, and shows when it was constructed, what its capacity is, and how much water it has used, or can use, for actual tillage. The court thereupon decrees to each company the number of cubic feet of water per second it is entitled to draw each season from the stream, and its rank of priority, *i. e.*, its order of precedence with respect to other canals supplied from the same stream.

These decrees are, of course, enforced. The State Engineer has general supervision of all matters pertaining to irrigation, and he is required by law to see that water is distributed in accordance with the court's injunctions. The State is divided into water districts, and for each district the Governor appoints a water commissioner, whose term of office is two years. It is his duty to divide the water in the streams of his district among the several canals, according to their rights as determined by the court; and, if need be, he may summon the sheriff to assist him in the discharge of his duties. The water commissioners are under the direction of the superintendents of irrigation, who have charge of the water divisions, each division embracing several water districts. The especial duty of the superintendents is to see that the laws are properly executed, and that the judicial decrees are enforced by the commissioners. The superintendents are under the general supervision of the State Engineer, and anybody has a right of appeal to him from a superintendent. The commissioners must report fully to the superintendents as often as the latter desire, respecting the supply of and demand for water in their respective districts, and all other matters deemed worthy of attention.

So much for the relation of the State to the canals. What are the farmers' relations to them? Water is disposed of to consumers in two ways—by rental and by absolute sale of the right to it. A company rarely attempts to dispose of water under both plans, for that has not been found practicable. A corporation seeking a permanent investment may construct a canal for the purpose of renting water to farmers at an annual rental "per inch."† Water rents, in Colorado, are from $1.50 to $2.50 an acre (or an "inch") per annum. If a farmer regards the rental exorbitant, he may have the matter brought up before the county commissioners, who, after hearing evidence on the part of the consumer and the company, can fix the sum. Their decision is final, so that practically the people control the rate. The principle which inspires the law to adopt this procedure is that the canal companies do not own the water, but are public carriers. If a farmer has once used water on his land, he can always compel the company to furnish it to him upon tendering each year the rental price established by the commissioners, the theory being that water, once applied to a tract of land, is a fixed appurtenance as long as the rental is paid. It cannot be transferred by the company or the farmer to other land without the consent of both parties.

But the usual and most popular plan of disposing of water is to *sell* a "perpetual right" to its use. When the constructing company on this plan has sold all of its water, the canal is owned and operated by the farmers as a stock company, shares of stock representing "inches" of water. The corporation is then a mutual company, escaping the hindrances of the law; and the consumer owns the right to his water, and pays only the annual charge for "maintenance and operation," generally 10 cents per acre. "Perpetual rights" on this plan are worth from $5 to $25 per acre. While the parent corporation exists, the purchaser obtains a deed or contract for his "perpetual water-right"—a temporary evidence of the right to use water. A "perpetual water-right," or simply a "water-right," is a right, good for all time, to sufficient water to irrigate eighty acres. When the farmers reorganize the company on a final basis, "water-right" contracts or deeds are superseded by shares of stock.

How the consumer farms under the irrigation system, and what are some of his advantages, next deserve notice. The farmer must conduct the water to his land from the headgate, or opening, through which he takes his supply. The headgate is always under the control of the superintendent of the canal, who divides the volume among the users. Each man's water flows over a weir—a device for measuring exactly how much the consumer receives. A lateral, or small ditch, is built from the main canal by the farmers of a neighborhood, and from it each one takes his share of the supply. The user contrives to conduct his water along the highest side of his farm in a smaller lateral, whence the stream is distributed over his fields by flooding, or conveyed in small channels between the rows of crops. Crops are usually supplied with water three times from the middle of May until about the 1st of August. A skilful man can irrigate from 80 to 120 acres of grain during a season, and can "go over" 80 acres in eight or ten days. In the fall another irrigation usually takes place, so that the ground may be in condition the following spring to germinate the seed. Very rarely is fall grain sown in Colorado.

Frustrated by neither drought nor flood, the husbandman is able to mature his crops to perfection, to accelerate or retard their ripening, and to bring harvest to suit his convenience. By applying water, he can keep half of his field green while he harvests the other half. The growth of grain is almost marvelous. In parts of the State, solid fields of oats and wheat five feet tall, with heads in proportion, are common. The grain itself is perfect in quality and usually over-weighs. But alfalfa (or lucerne) and leguminous plants yield the most astonishing results. Alfalfa is the most beautiful, wonderful and profitable crop raised in the Rocky Mountain region. A field of it, with its sweet-scented, purple blossoms, is a perfect garden of beauty and perfume. It is a kind of clover, and highly nutritious; it grows about two feet high, and, being perennial, its roots reach down usually five feet deep. Alfalfa is first harvested in June; then water is applied, and in four weeks it is cut again; the water is reapplied, and it is ready for another harvest a month later. Each cutting of a good crop will yield two tons. It is worth in Colorado from $7 to $10 per ton. It will be seen that irrigation is simply an *insurance*—it assures a certainty of return for the year's work.

In passing from the subject of irrigation in Colorado, attention should be called to the surprising effect of the canals on the volume of a stream. It would seem natural that, if the full capacity of a river were directed into a channel, there would be no supply for ditches lower down the stream. With this in mind, the people of Western Kansas and Nebraska, realizing the necessity of irrigation, are inclined to complain because all of the water in the eastern-flowing streams of Colorado is appropriated before reaching their borders. However, both experiment and theory show that their fears are groundless. The State Engineer of Colorado gives the result of his investigations of this subject in his report for 1885-'86, before there was any expectation of inter-State contention, and when the people of those parts of the plains more remote from the mountains had no thought of the necessity of irrigation for their region. He made the experiment in the Cache-la-Poudre, a stream of Northern Colorado, and says: "Starting with a flow of 127,609 cubic feet per second in the cañon, before any water is drawn into canals, the volume at the lower point, after supplying fifteen canals, had increased to 214,508 feet per second, showing an addition of more than two-thirds of the original amount, to supply canals further down the valley." The reason for this is, that all the water withdrawn from the river for irrigation gradually seeps back into it, making a steady and reliable current. But for this fact, the water would rush down the sandy beds of the rivers in torrential streams, disappear quickly, and be of slight avail for the irrigator's purposes.

That irrigation is destined to be practiced widely in the United States admits of no doubt. Without it the western half of our country would not be susceptible of cultivation. All the valleys and great parks and *mesas* of the West, whether at an elevation of 500 or 5000 feet, whether in the Rocky Mountains, the Sierra Nevadas or the Coast Range, demand irrigation. The same may be said of the vast arid plains—the "bad lands" of America—which lie between the 22d and 27th meridians. Although their soil is almost as rich as that of the valley of the Ganges, they are, without water, a desert, and, with water, marvelously productive. They will some time be covered with extensive and costly systems of reservoirs stretching eastward from the mountain lakes. Nor is it venturesome to predict that irrigation will some time be quite extensively employed in considerable portions at least of the Eastern, Middle and Southern States. There are two grounds for this prediction. The sure and sufficient supply of water for his crops is the greatest desideratum for the farmer. Irrigation not only provides this supply, but it fertilizes the land. The silt-bearing, mountain water spreads rich soil-food over the fields, and renews and reinvigorates them each season. Although the expense of constructing irrigating canals in the States east of the Mississippi would be great, the enormous sums now expended in fertilizing stuffs, which would not then be needed, might perhaps pay the whole cost. If, for instance, the farmers of the Genesee Valley in New York State should distribute

* A cubic foot per second is becoming the module in Colorado, and is that volume of water which will flow, during the irrigating season, through an orifice one foot square. It is sufficient to irrigate about fifty-four acres.

†An "inch" of water means the "statutory inch," *i. e.*, that volume of water which will flow in a second of time through an inch-square orifice, under a five-inch pressure. An "inch" of water is generally considered, in Colorado, sufficient to irrigate one acre; but it is an inaccurate term, and is fast falling into disuse.

over their farms the never-failing waters of their neighboring lakes with the vast amount they pay annually for guanos, their outlay per annum might be no greater than at present, and their income would be greatly increased. Guanos add nothing to the permanent amelioration of their farms; but the irrigating canals would be a fixed improvement, and, making possible the increased revenues arising from the additional quantity and the improved quality of the grain produced, and produced without failure, would add to the value of their farms many fold.

ELECTRIC WELDING.

The following description, by Professor Elihu Thomson, of this process and the various modifications of which it is capable will be as interesting to many of our readers as it was to the members of the Franklin Institute who had the good fortune to be present when Professor Thomson illustrated his remarks by the apparatus exhibited.

About a year and a half ago, said Professor Thomson, I gave a description of the newly developed art of electric welding, calling attention to the principles underlying its practice and the results accomplished in the welding of various metals and alloys.

On the present occasion, the purpose is to show the apparatus, or at least a few forms of it, in operation, and to describe the working and construction.

Quite a number of types of apparatus have been developed, some of which are before us, and others we have at our factory at Lynn, Mass.

What we call the indirect, or induction, type takes current of comparatively high potential from a dynamo giving alternating currents, or from any other suitable source, such as a lighting supply line, and converts or induces from it a current of very low potential and great volume for electric welding, soldering, brazing and forming of metals. One form of apparatus, which will be used for welding iron and copper wires, is here before you (Fig. 1).

The "direct" type generates the currents needed directly from belt power or mechanical energy, and consists of a specially organized dynamo provided with a set of welding clamps. In fact the needs of electric welding have given rise to a number of special and somewhat curious types of dynamos which might not otherwise have been invented or constructed. But one of these forms is here shown, a number of others having been designed and constructed and others again are undergoing construction. Fig. 2 is an example of a type of direct-welding dynamo, similar to the one on the platform, belted to the Institute engine.

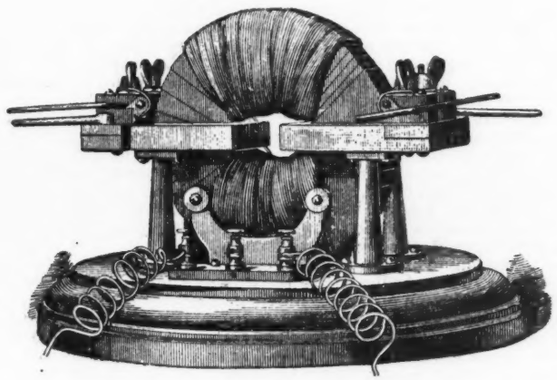


FIG. 1.

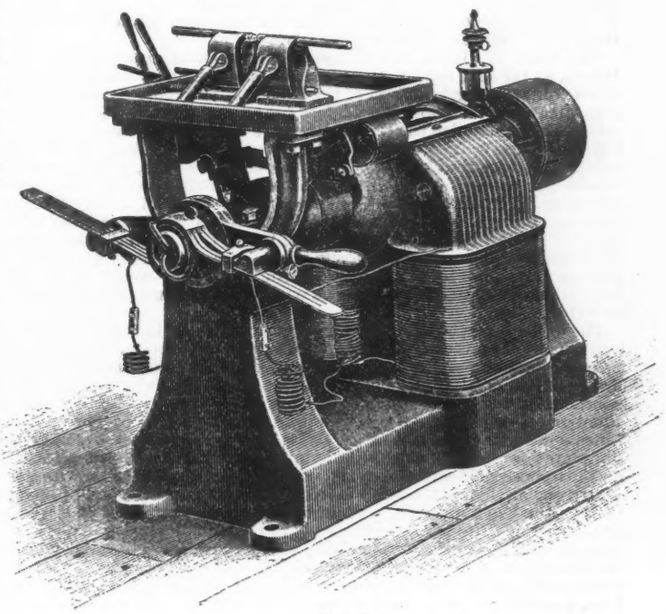


FIG. 2.

The storage battery, properly arranged, constitutes another type. It is charged from a line, or by a small dynamo kept running constantly by power. Since the welding or heavy-discharge currents are only needed at intervals, a comparatively small dynamo will usually suffice for the charging. We have used a suitable cell of storage battery quite successfully in electric welding. Even primary batteries may, if of sufficiently low internal resistance, be used for the work, but are comparatively expensive to run.

Variations in the proportion and details, especially of the clamping devices, are made to suit the nature and size of the work to be done, and the shape of the pieces to be handled.

It may be mentioned that for some purposes a combined engine and dynamo for welding may come into use, especially where the work is intermittent. Thus an apparatus in all respects like a steam fire engine, but with a dynamo generating the requisite currents and substituted for the pumps, would be useful where portability is requisite and comparatively heavy work is to be done in isolated localities. The fact that the work is intermittent permits the use of less boiler capacity than would be the case were the plant to be under full load continuously.

I call attention to the numerous examples of work done as exhibited by the specimens which are found on the two sample boards before you and upon the table. Here is a unique specimen, a shaft with two collars, formed without any welding at all, by simply pressing it endwise by the clamps with the current put on.

Here, again, is a very curious piece, which I am sure could not be produced at all without such apparatus as is shown here. It demonstrates the rapidity with which work can be done, and the localization of the heating effects.

The specimen referred to is one in which a bar has been put through a hole in a flat piece of wood, so that the wood is held between the two expansions in the bar, and almost pinched between them. The operation was so quickly done that the heat had not time to char the wood and enlarge the hole; or, if I may be permitted to say it, the wood had not time to find out that it should burn.

Among the specimens here are rings, cast-iron pieces, various tools constructed by use of electric welding, chains and links, etc. The various metallic alloys, as brass, German silver, are seen, in addition to heterogeneous welds or welds of different metals one to the other.

Many persons are puzzled to know how a ring can be welded at all by the current, especially such small and thick rings as are here shown, but there is no mystery about it. The current goes by the short path in greatest amount, and so welds the ring. This is particularly true of alternating devices, which absolutely prevent more than a small fraction of the current going around the ring. To do this we have only to establish conditions such that a current going around the ring has to produce magnetism in a closed iron core, while that which does the welding is comparatively free from such necessity. In such cases, self-induction and resistance are both acting together to prevent flow around the ring instead of across the joint to be made.

Tests of tensile strength of electric welds are eminently satisfactory, and the occasion may sometimes come when I can present the results, or consider for you electric welding from the standpoint of its perfection as a welding process. Its utility is, however, already established. It does many things which no other process can do or has done.

Here is a sample of lead pipe welded without obstruction of its interior, and even without expansion outside. At a short distance away, the pipe cannot be distinguished from a plain piece, and its exterior has been left just as it came out of the welding clamps.

Here again is a finished axe, with the steel cutting edge welded to the body by electrical means, the welding being the last operation done before final grinding for finish.

Here is a steel rake made by electricity, and several specimens illustrating the making of carpenter's squares by electric welding.

He used both the induction coil type (Fig. 1), and the direct types (Fig. 2). Some of the apparatus was remarkable for its small size in relation to the size of the pieces upon which it would successfully operate. The devices for holding the pieces in place, putting on the current and giving the pressure to the pieces were shown to be very simple and easily operated.

He also exhibited some automatic apparatus, in which the pressure given is automatic, and the current stops when the weld is completed, thus enabling the operation to be indefinitely repeated in the same way without involving skill on the part of the operator.

ELECTRIC WELDING APPARATUS.

Determination of Manganese in Steels—Franck Julian.—One gram of metal is dissolved in 15 c. c. of nitric acid (sp. gr. 1·2) evaporated down to 5 c. c., 20 c. c. of strong acid are added, and the liquid is precipitated in heat by potassium chlorate, avoiding a large excess. There are then added successively to the mixture 5 c. c. of strong nitric acid, 60 c. c. hot water, and 10 c. c. of the oxalic solution. The liquid is agitated until it takes a light yellow color, and the excess of oxalic acid is titrated by means of permanganate, operating at a temperature of about 70 degrees. The manganese dioxide dissolves rapidly under the influence of oxalic acid; the back titration is done quickly, and the end of the reaction is easily found after a little experience. The solutions employed are: Ammonium oxalate at 15 grams per liter. Potassium permanium at 1·6 per liter. To determine the standard of the permanganate we take 10 c. c. of the solution of oxalate, add 50 c. c. of hot water, and the nitric solution of 1 gram of steel, from which the manganese has been eliminated by precipitation with potassium chlorate and separating the precipitate with an asbestos filter.

THE UNITED AND CHAMPION COPPER MINES OF NEW ZEALAND.

Written for the Engineering and Mining Journal by Carl Henrich, M.E.

A description of the United and Champion copper mines of New Zealand may be interesting, not only in consequence of the special attention paid to copper at present and because these mines are known as the best and are the best developed of any of the copper ore-deposits of the colony, but also because the formation of the veins in eruptive rock constitute a peculiar type, a description of which may be of use for a future classification of ore-deposits.

The eruptive rock, in which they occur, forms an enormous dyke running in a northeasterly and southwesterly direction, through both islands. The northern end of this dyke is in the harbor and bay of Auckland, in the northern island. In the diorite and serpentine rocks of some of the islands of that bay copper ore-deposits have been found and worked in a small way. Further to the southwest, in the center of the North Island, the old lava, consisting of the eruptive diorite, dialage and serpentine rock, is overlaid and covered by the newer volcanic lavas and tufas, the newest layer of which was deposited only a few years ago in the volcanic outburst, which destroyed those natural wonders, the pink and white terraces, and converted the site of these beautiful products of nature into a boiling mudlake.

At the south end of the North Island we find smaller outcrops of these old lavas again, and on D'Urville Island, south of Cook's Strait, we find copper ore-deposits again in the serpentine or dunite, forming the larger part of that island and of Mt. Dun on the east side of Tasman Bay in the South Island. The deposits of Mt. Dun have been described by Hochstetter, and after his description have been cited by von Groddeck in his classical work on ore-deposits. To this description and classification by von Groddeck I shall refer later on.

The dyke of diorite and serpentine mentioned, runs in the South Island, as far as it can be traced by its outcrop, in a width of several miles from the northeast end of the island in D'Urville Island, which is separated from the South Island by a channel of only a few hundred yards width, through which the tide rushes like a mill-race, to south of Lake Rotoiti, in whose vicinity is located also the only active volcano in the South Island. We see thus that this dyke of eruptive rock, which evidently marks the course of the fissure, through which this old lava poured out probably in Miocene time coincides with the line of modern volcanic activity, and it is very probable that volcanic activity has always been present in New Zealand from Miocene times, *i. e.*, from the first outpour of this enormous mass of diorite and serpentine lava, down to the present day, and to the volcanic outburst a few years ago, which covered about 40 to 50 square miles with volcanic mud from a few inches to 20 feet deep.

The dyke of serpentine in the province of Nelson, in which the United and Champion mines are located, breaks through the sedimentary rocks near the junction of the lower carboniferous limestone and the Silurian or Devonian, crystalline siliceous slate. The dyke does not follow the contact of these different geological formations, but is located near the junction of the two, so that we find small patches of carboniferous limestone on the east side of the dyke, and also small patches of crystalline slates on the west side, although the main masses of these rocks are on the opposite sides of the dyke. The sedimentary rocks are tilted to a very steep angle and the pitch is to the northwest at an angle of about 60 to 70° from the horizontal, with of course local variations and foldings of the strata. The whole dyke seems to have about the same pitch at its contact with the sedimentary rocks, and is therefore an intrusive sheet of a thickness of several miles, which of course, indicates a very large number of repeated openings of the fissure and repeated outpourings. This, however, is only what we ought to expect. The volcanic activity of those days was very probably quite similar to the volcanic activity of the present time, even if we suppose that the outpouring of the lava occurred rather from long fissures in the earth's crust than from separate spots along such a fissure, which we call volcanoes now-a-days. As in the case of this huge dyke, we might well suppose that volcanoes of our present type might have been active in Miocene times just as well as to-day, that these ancient craters or volcanic mountains had succumbed to the destroying agency of time and helped now to fill the valleys with alluvial deposits and the sea with the sand at its bottom. In the dyke as we see it now, we would have to deal with the old underground fissure, gradually widened at each successive eruption and filled with the old lava as the fissure widened. The lava of the different outbursts now cooled side by side, and forming the different eruptive rocks, as serpentine, diorite, dialage, dunite and all kinds of similar volcanic or plutonic products, which it is hard to assign to the one or the other subdivision of rocks, and which I believe to be profitless to even attempt. They all are evidently rocks of the same origin, and probably cooled faster or slower, and crystallized under different conditions of pressure, and formed by the melting together of probably somewhat different rocks of older formations, a little more or less sandrock or slate, with a little more or less limestone, dolomite or clay slate, thus producing this endless variety of serpentine, dialage, diorite, dunite, hornblendic rock and others. The local custom bunches them all together and calls them "serpentine," and seeing no good reason for any special distinction, I will follow the custom and call all these eruptive rocks "serpentine." With this understanding, that it is not only serpentine rock of which I speak, but all these varieties comprised under this one name, I will proceed to the description of the ore-deposits and the mines.

The mines are located near the western edge of the dyke in the serpentine, the United mine being situated about one mile north of the Champion mine. They are both in the Aniseed Valley, the main stream of which valley flows into the Wairoa River.

The lower part of this valley, formed by the limestone and the crystalline slates, mentioned above, is thickly wooded with birch and pine trees, peculiar to New Zealand. In these woods are found the celebrated fern trees, besides more varieties of ferns than in any other part of the world, and creepers and climbing plants in such profusion that it is almost impossible to penetrate the "bush" in places. Besides these we find the fuchsia reaching the size of a tree 10 inches in diameter and 30 feet high, strewing the ground with its flowers and bearing a sweet black berry, almost the only wild berry of these woods.

As we reach the serpentine belt farther up the valley, the forest disappears, and the extent and direction of the belt is easily followed by the wide strip of treeless country which it forms between the densely wooded lands on either side.

As I have said, both mines are located near the western edge of the serpentine dyke. The dyke here is at least three to four miles wide, forming the water-shed between the Wairoa River, into which Aniseed Creek empties, and the Pelorus River, flowing down to the east coast of the South Island.

The United mine was opened on the outcrop of a body of iron and copper pyrites, oxidized only to a few feet below the surface. The ore occurs in a fissure running in a northeasterly and southwesterly direction, between a darker greenish, sometimes black serpentine, and a lighter-colored variety of the same rock. The *black* color of the serpentine seems to be due to some organic ingredient (carbon) in the rock, as the rock burns to a white color in the muffle, unless there is enough iron in the rock to give it a reddish color when exposed to the oxidizing agency of the air and heat.

The ore deposit, when first opened in tunnels Nos. 1 and 2 from its outcrop into the hill, had all the appearance of a continuous fissure-vein. After following the ore, however, for about 15 feet in tunnel No. 1 and for about 100 feet in tunnel No. 2, the ore was found cut off by a cross-seam, and although by following this cross-seam in a southeasterly direction for about 15 feet, the continuation of the lost ore-body was found, it played out again in a few feet, and following the seam between the darker and the lighter serpentine, as best possible for over 200 feet, failed to encounter any more ore except one small pocket in the floor of the drift, containing about 15 to 20 pounds of ore. The following of the seam even was done under great difficulties, as the dark, black color of the serpentine was found less distinct, when the ore-body was lost and grew less so with greater distance away from the ore. The serpentine, besides, is fissured in all directions, and with the absence of the ore as a guide, and with the difference in the appearance of the serpentine becoming less marked with every foot away from the ore, it became impossible to tell finally whether we were following the same fissure, the last 50 feet of the drift being driven under the guidance of the compass, without regard to any fissure.

The direction of this drift, however, was toward the Champion mine, which is located on the opposite side of the valley, across the mountain, into which this drift was being driven. The direction of the fissure filled by the ore-body, and the direction of the main drift of tunnel No. 2 of the United mine, is the same as that of the large dyke of serpentine, traceable for a length of 120 miles in the South Island alone, and apparently keeping this same direction for a few hundred miles northeasterly to the Bay of Auckland, in the North Island.

With much better success in finding ore, this same ore-bearing fissure of the United mine was traced and opened in a northeasterly direction from the mouth of tunnel No. 2, by the four lower tunnels, No. 3, No. 4, No. 5, and No. 6. In this direction the fissure was found continuous for over 650 feet to tunnel No. 6, and thence farther to the northeast still, but not opened any farther. In this crevice the four ore-bodies *A*, *B*, *C*, and *D*, shown on the section of the mine workings (Fig. 1), were found and partially opened, as shown on the section.

About 10,000 tons of ore were thus exposed ready for stoping, only counting the area of the ore-bodies above the different levels driven through them. The continuation of these bodies to greater depth, and consequently a greater amount of ore in the mine, is proved beyond doubt. But how much farther down each ore-body extends is very uncertain. That these ore-bodies have a lower boundary as well as in any other direction; that they form, in other words, lenticular-shaped masses in the fissure in which they are found, is at least very probable from the proven character of the ore-deposits in the neighboring Champion mine.

The cut-off of ore-body *A* in tunnel No. 2 and its short continuance farther southeast, is evidently effected by the cross fissure *F F* marked in the section which faults the ore-bearing fissure and the ore-body *A* contained in it, and throws both farther southeast in their southwesterly continuation. This fault is evidently younger than the ore-formation.

Much prospecting by long cross-cut drifts at the other side of the mountain on a direct line between the United and Champion mines has failed to reveal any additional ore-bodies to the southwest of ore-body *A*. Still there is a possibility that another or other ore-bodies may be found along the southwesterly continuation of this fissure, only as already stated it will take considerable care in following the fissure and much cross-cutting to be sure that it has been followed, and the sought-for ore-body not been missed by running by the side of it.

The ore contained in the mine, from this result of several thousand tons mined and sampled, contains about 7½ per cent copper, which at present prices will pay for the mining and reduction, and will justify the erection of small works with reverberatory roasting and smelting furnaces. The existing works of the former Champion Copper Company are altogether too large for the capacity of the mines.

The Champion Mine.—The openings of this mine, as will be seen from the plan, Fig. 3, are of a very intricate and quite extensive character. Although many—really most of these openings—were driven by a former drunken mine captain of the former Champion Copper Company, with the sole object apparently of spending money in mining work, and without the least understanding of the character of the ore-deposit he was trying to explore; still there are enough openings made in the right direction and in following and stoping the ore-bodies found, most of which cropped out on the surface—to get a clear idea of the shape and character of the ore-deposit.

A vertical cross-section of the deposit in a southeast-northwest direction, or square to the general direction of the large serpentine dyke, and square to the course of all the ore-bodies found in this mine, is given in Fig. 4. This shows a body or dyke of dark colored serpentine, dark green to black in color, between bodies of lighter colored serpentine. This body of dark colored serpentine is most distinctly thus colored near either edge, while the center of this body resembles more the serpentine found on either side, or what might be called the country-rock. Still a

decided difference between these rocks, especially in this district, where the dark colored serpentine is ore-bearing, is always observable. The ore-bodies are found in this dark colored serpentine at its edges and near the contact with the lighter colored serpentine. No ore-body has been found so far, in or near the center of this body of dark colored serpentine. The black color here, as in the United mine, due to carbonaceous matter in the rock, is found most in the immediate vicinity of the ore-bodies, and is, therefore, a good indication of ore in these mines.

The ore-bodies, occurring at the edges, the hanging-wall and the foot-wall of this body or dyke of dark serpentine, are neither continuous in their strike nor in their pitch. They form lenticular masses along the fissures. These ore-bodies are of more variable thickness, however, than the ore-bodies of the United mine. This, however, is probably caused by a more intense oxidation of the ore as originally deposited, and by its secondary redeposition and redistribution in the crevices of the dark serpentine more removed from its original place of deposition as copper pyrites in the contact fissure between the dark and light serpentine. This secondary formation is also shown in the different character of much of the ore. While the ore of the United mine is all found as iron and copper pyrites, much of the ore of the Champion mine has been found as native copper in large and small slabs filling the crevices of the serpentine and as oxidized copper ores, like cuprite, malachite and azurite. On account of this character of the ore, especially near the outcrop of some of the ore-bodies where the veins of native copper mixed with oxidized copper ore seemed to be 6 or 8 feet thick, looking like true fissure-veins, the population of the whole province invested in copper stock and the fame of the Champion mine filled the colony.

A fault, marked on the plan, where it crosses the different levels of the mine, cuts diagonally across the serpentine dyke, and throws the foot-wall of the southern continuation of the dyke nearly opposite and in seeming continuation of the hanging-wall of the northern side of the fault.

Thus the ore-deposit at the foot-wall exposed in Champion tunnels No. 1 and No. 2, and the winzes from both, seems to be cut off and lost, while in reality it is thrown in seeming continuation of the ore-deposit exposed on the hanging-wall in Doctor tunnels No. 1 and No. 2 and in the slopes above these tunnels. Only the lenticular body of the Doctor deposit ends already before reaching the fault, and it is the cut-off part of the Champion deposit, thrown about 150 feet further to the east which the south end of the Doctor tunnel No. 2 cuts. Long tunnels and cross-cuts were driven in the foot-wall county-rock south of the fault to seek for the lost ore-body of the Champion tunnel No. 2.

No ore was ever found in the shaft sunk on the north side of the creek, nor in any of the tunnels and cross-cut driven on the probable continuance of the "veins," on the north side of Champion Creek.

The best chance for prospecting for more ore is evidently by sinking the new shaft, started by the writer, and prospecting along the foot and hanging wall of the dark serpentine dyke, south of the fault.

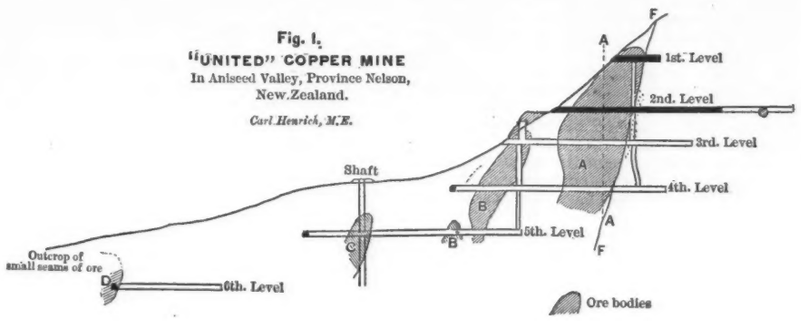
The oxidized ore near the outcrop continues to some depth below the surface, but gradually changes to the same iron and copper pyrites, found in the United mine.

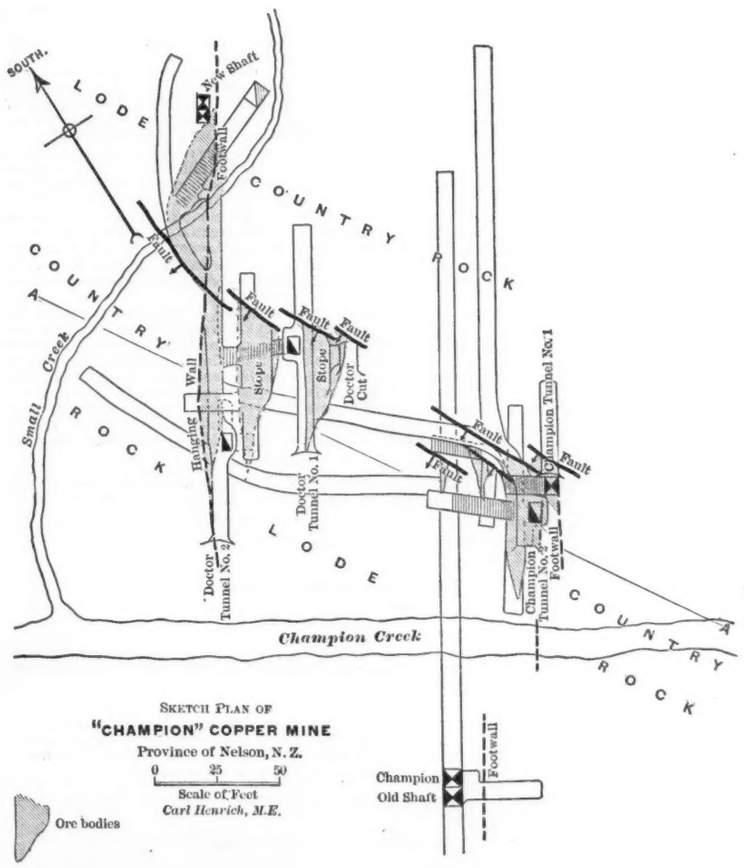
The Champion mine is situated the same short distance from the contact of the large serpentine dyke with the sedimentary rocks to the west as the United mine. It belongs evidently to the same eruption of dark serpentine, running inside the large porphyry dyke and in the same direction.

The Champion ore-body of the Champion mine is along the foot-wall of the dyke of dark serpentine. The foot-wall of this same dyke has never been prospected in the United mine, but would surely be a promising place to prospect for ore, only that much of it has been scoured away by the erosion of the softer dark serpentine body, which formed the steep ravine in which the United mine is located.

Taking all these facts in consideration, that in both mines we have to deal with lenticular bodies resembling upright sheets of iron and copper pyrites, deposited along the walls of a smaller serpentine dyke in the large serpentine dyke of the country, these ore-bodies seem to occur especially at those places of the small dyke, where its outer portions are

Fig. 1.
"UNITED" COPPER MINE
In Aniseed Valley, Province Nelson, New Zealand.
Carl Henrich, M.E.





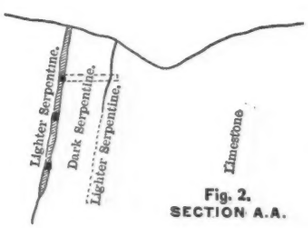
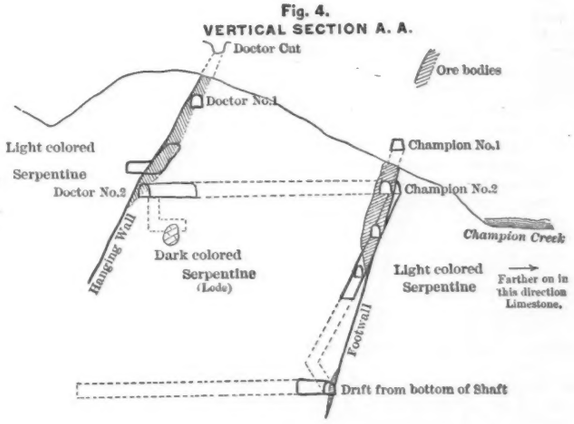


Fig. 2.
SECTION A.A.

Fig. 4.
VERTICAL SECTION A. A.



colored dark, or even black, by carbonaceous matter impregnating the rock. Both mines are located, and ore is only found on the south sides of the streams and on the north sides of the mountains. Whether this is accidental or whether the cause of the ore deposition and of the formation of these parallel valleys and mountain ridges have some connection, is so far not known. The ore-deposits, however, certainly cover only a small proportion of the walls of this dark serpentine dyke, along which they occur.

Von Groddeck, in his "Ore Deposits,"* in the subdivision "Massive Deposits," Section 80, puts the type "Wooded Peak"—Characteristic: enclosures of chrome iron ore in olivine rocks and in serpentine—as a special type. This "Wooded Peak" in New Zealand is the southern extension of Dun Mountain, and embraces the very region in which the Champion and United mines are located. In the following type of ore-deposits, Section 81 (still belonging to the division of "massive deposits") he puts the type Mednorudjansk (page 147). Characteristic: enclosures of pyrites, iron pyrites, magnetic pyrites, chalcopyrites, peacock ore, etc.; more rarely of other sulphide ores, galena, blende, gray copper, etc.; in massive rocks, most frequently in diorite, gabbro and olivine rocks (serpentine). Of this type he says:

"In comparison to the great mass and frequent occurrence of magnetic iron ore in massive rocks, pyrites are rarely met with. Iron pyrites, one of the most common minerals, is rarely altogether wanting, and is found under circumstances which point to a contemporaneous formation with the essential components of the massive rocks, as, for example, in diabase and diorite rocks."

"These rocks, as in general such as carry augite and hornblende, contain especially chalcopyrites in crystalline impregnations and nests.

"According to observations of local concentrations of the magnetic iron ore in massive rocks, in which it is found everywhere in a finely disseminated state, such a local concentration must be accepted also as an explanation of these larger occurrences of pyritic ores in the massive rocks.

Of some consequence also seems to be the contents of copper in these rocks (containing olivine), as we find such copper contents in serpentine, which has, no doubt, been formed out of olivine rock, as, for instance, at the "Wooded Peak"† in New Zealand. Traces of copper, especially of green and blue silicate, which incrust fragments of serpentine, are found frequently in that locality. Where such indications of copper ores have been found on the surface only nests of cuprite, black copper ore, peacock ore and copper glance have been found, never any true copper ore veins."

Von Groddeck took his information from von Hochstetter's description of the geology of New Zealand. While this source is doubtless the very best available on the subject, still at the time of von Hochstetter's investigation of the copper ore-deposits of this region, the known copper ore-deposits consisted of some pockets on Dun Mountain and Wooded Peak in the very center of the large serpentine dyke. The character of most of these deposits may have appeared as nests and pockets to von Hochstetter. And it is only through the difference in lithological character and in their coloring, that the writer has been enabled to find the relation of the described copper ore-deposits to the dark-colored dyke of serpentine in the lighter colored serpentine. Besides the two mines described were opened to a much larger extent than any of the shallow diggings on Dun Mountain, and the circumstances under which these ore-deposits occurred were doubtless much more favorable to the recognizing of the true character of these deposits, than at those ore-deposits which von Hochstetter had a chance of observing on Dun Mountain.

The deposits of copper ore in the massive serpentine rock of New Zealand are doubtless the filling of fissures or the changing of rock along these fissures into ore, which fissures form the boundaries, foot and hanging walls of a serpentine dyke inside the larger one, or which fissures probably form the boundary lines or planes of one of the many separate eruptions of serpentine or olivine, which series of eruptions gradually formed the enormous dyke of serpentine, now several miles wide and in continuous observable outcrop at least 100 miles long.

These ore-deposits certainly do not belong to the class of contemporaneous ore-deposits (contemporaneous in their formation with the inclosing rock), into which von Groddeck puts them, but belong to the class formed subsequent to the formation of the inclosing country-rock, and forming along a pre-existing fissure, therefore probably to the class of fissure-veins, as "at present" classified, although differing most decidedly from that type usually described as a sample of fissure-vein in most text-books on the subject.

The plans and sections of these mines are drawn from remembrance after maps made from surveys by the writer. While not claimed to be correct to the foot or in all proportions, still they are substantially correct, and the shape of deposits and ore-bodies are such as actually found in these mines. The distance in Fig. 1, from *F* to tunnel mouth No. 6, is about 650 feet, and the elevation of tunnel No. 1 above tunnel No. 6 is about 350 feet.

* Von Groddeck, Die Lehre von den Lagerstaetten der Erze, Leipzig, 1879.

† Berg-und hüttenmannische Zeitung, 1865, p. 91.

A Siberian Railway Syndicate.—A powerful American syndicate is about to be formed for the purpose of building railroads in Siberia. Besides a large subsidy the Russian government will give 4,000,000 roubles yearly for the transportation of mails and convicts.

Quaker Bridge Dam and Reservoir, New York.—The Aqueduct Commissioners have given notice to all persons interested that full opportunity will be afforded them to be heard in relation to the necessity of constructing the proposed dam and reservoir upon the Croton River at Quaker Bridge, known as the "Quaker Bridge Dam and Reservoir," on the 19th inst., at the office of the Commissioners, No. 280 Broadway, New York city.

Tank Steamers for Oil Transportation.—The new method of oil transportation by means of tank steamers saves, it is said, expenses to the extent of fully $2300 on every cargo of the tank steamers that leave this port, taking 20,000 barrels. The agents of the bulk steamships will not admit that it is cheaper to carry the oil by the new method, though the fact that new vessels are being freely built is considered to be proof sufficient that there must be some money in it. The following statement shows the amount of money saved by the steamers in the way of outside charges. The calculations are made on the basis of the average-sized tank steamer, 20,000 barrels:

Inspection of stowage, 1c. per bbl	$200
Inspection, oil and barrels, 2½c. per bbl	500
Stevedore's charges, 5c. per bbl	1,000
Dunnage, &c., $30 per 1,000 bbls	600
Total	$2,300

Steamship men claim that the money saved in wharfage will easily cover the expenses of extra crew, coal, and other items incidental to a steamer. Consequently there is reason to question the accuracy of the claims of the tank oil shippers that they do not save anything by shipping oil in bulk.

The Bell Telephone Patent.—The Bell Telephone Company, which has defended more or less successfully the priority of its patents, has now to answer a suit on the part of the Government for the cancellation of the Bell patents, on the ground that they were obtained by fraud. The company resisted chiefly on the contention that the Government had no right to sue in its own courts for the cancellation of a patent that had been procured by fraud. The Supreme Court of the United States has promptly settled this question as follows:

"It will be observed that this broad assertion admits that a party may tice intentional fraud upon the officers of the Government, who are authorized and whose duty it is to decide upon his right to a patent, and that he may by means of that fraud perpetrate a grievous wrong upon the general public, upon the United States, and upon its representatives. It admits that by prostituting the forms of law to his service he may obtain an instrument, bearing the authority of the Government of the United States entitling him to a monopoly in the use of an invention which he never originated, or a discovery which was made by others, and which, however generally useful or even necessary it may become, is under his absolute and exclusive control, either as to the use it may be put to or as to the price he may charge for it during the life of the grant. It assumes that the Government, which has thus been imposed upon and deceived, is utterly helpless, and that it can take no steps to correct the evil or to redress the fraud. If such a fraud were practiced upon an individual he would have a remedy in any court having jurisdiction to correct frauds and mistakes and to relieve against accident; but it is said that the Government of the United States—the representative of sixty millions of people, acting for them, on their behalf, and under their authority—can have no remedy against a fraud which affects them all and whose influence may be unlimited. Though, by the Constitution, it is declared that the judicial power shall extend to all cases arising under the Constitution or laws of the United States, it is asserted that the practice of a gross fraud upon the United States concerning matters of immense pecuniary value and affecting a large part of its population is not a proper question for judicial cognizance. It would be a strange anomaly in a Government organized upon a system which rigidly separates the executive, legislative, and judicial branches to hold that in that department there should be no remedy for such a wrong."

"'The United States is under an obligation in the present case to protect the public from the monopoly secured under a patent alleged to have been procured by fraud.' By issuing the patent it has 'taken from the public rights of immense value and bestowed them upon the patentee. That the Government, authorized both by the Constitution and the statutes to bring suits at law and in equity, should find it its duty to correct this evil, to recall these patents, and to give a remedy for this fraud, *is so clear as to need no argument*, and the proper remedy is the one adopted by the Government in this case.' And so the decree of Judges Colt and Nelson is reversed and the case is remanded to the circuit court for trial."

It is to be hoped that this monopoly, which has withheld from public use, by imposing extortionate charges, an invention that should be at the service of all will be put an end to, and as the evidence has shown much crooked work in getting this patent, there is a prospect that right will be done at last in this case.

BOOKS RECEIVED.

[In sending books for notice, will publishers, for their own sake and for that of book-buyers, give the retail price? These notices do not supersede review in another page of the Journal.]

The Metallurgy of Gold. A practical treatise on the metallurgical treatment of gold-bearing ores, including the processes of concentration and chlorination, and the essaying, melting and refining of gold, by M. Eissler. Published by D. Van Nostrand, New York. Pages, 188. Price, $2.50.

Poor's Directory of Railway Officials. A supplement to Poor's Manual of Railroads, 1888-9. New York.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

PATENTS GRANTED NOV. 13TH, 1888.

392,611. Device for Compressing Air. John S. Hunter, Chicago, Ill.
392,627. Artesian-Well Drilling Device. Watson C. Mobley, Allegheny, Pa.
392,653. Rotary Engine. George H. Weston, Boston, Mass.
392,660. Insulation of Cores of Dynamo-Electric Machines. Benson Bidwell, Chicago, Ill.
392,661. Ore-Crusher. John M. Bryan, San Francisco, Cal.
392,664. Conduit for Electric Railways. Henry A. Chase, Stoneham, Mass.
392,679. Electric Speed-Governor for Water-Wheels. George M. Lee, Little Falls, N. Y.
392,730. Wator-Motor. Wright Howard, Fitchburg, Mass.
392,802. Hydrocarbon Oil Burner. Wm. C. Heister, Springfield, O.
392,804. Furnace. Samuel S. Hersey, Auburn, Me.
392,858. Dredging-Machine. Joseph G. Falcon, Chicago, Ill.
392,860. Plate-Amalgamator. Apolinaire Gauthier, Grass Valley, Cal.
392,868. Process of Utilizing Coal-Dust. Cornelius Kimplen, Chicago, Ill.
392,881. Sectional Boiler. George G. Prefantaine, Whitehall, N. Y.
392,897. Regenerative Gas-Furnace. Oscar B. Weber, New York, N. Y.
392,929. Process of Extracting Gold and other Metals from Sulphide Ores or Compounds containing the same. Alexander Parkes, Dulwich, County of Surrey, England.
392,947. Furnace. Gates A. Clark, Rochester, N. Y.
392,974. Coal-Washer. Sebastian Stutz, Pittsburg, Pa.

THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 397.)

Clearly the bending here is not due to the temperature as such, but to something which happens while the temperature is passing W, and apparently during the change from the cement- to the hardening-carbon crystallization. Like instances of the temporary weakening of steel during other changes of crystallization will be described in §§ 255 and 256 D.

4. *Thermal Phenomena.*—The apparent specific heat, at least of pure iron, rises suddenly at about 1,050° C.

§ 255. Recrystallization on Reheating Quenched Steel.—In line with Brinnell's experiment showing that, though the cement-carbon hackly fractures of annealed steel do not change on reheating to below W, the hardening-carbon granular fractures do; with the heat evolution and with the change of carbon from hardening to cement which occur when hardened steel is reheated to 210° C. (410° F., a pale straw color), is the following experiment of Coffin's, showing that hardened steel becomes more flexible on slight rise of temperature than tempered, *i. e.* partly annealed steel does.

Two exactly similar half-inch square steel bars, five inches long, A and B, Figure 69, were hardened. A was then heated to a blue tint, part of its carbon presumably becoming cement. They were then clamped together at the ends, wedged apart slightly in the middle, heated

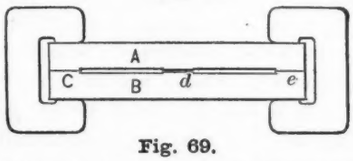


Fig. 69.

slowly and uniformly to a light straw color, and slowly cooled. A, in which no change of carbon should have occurred, retained its previous shape, while B, whose carbon should have changed in part to cement during heating, became slightly concave towards its mate.[a]

The flexibility of steel under these conditions seems to be known and taken advantage of by makers of steel tools, who correct the shape of the hardened tools slightly, by pressure applied on reheating them to but not above a very light straw tint.[b]

§ 256. Recrystallization During Slow Cooling from W.—Here a remarkable evolution of heat, known as the "after-glow," "recalescence" or "Gore's phenomenon," manifested by marked rise of temperature and re-expansion, and accompanied by great temporary increase of flexibility, occurs, beginning apparently as the temperature approaches V, which as we have seen appears to be a critical point for the change of carbon from hardening to cement, and of fracture from granular to hackly. Its intensity increases with the proportion of carbon present. Barrett failed to detect it in case of manganese steel,[c] nor could I detect it by the eye in case of the tungsten steels Nos. 5 and 6 of Table 34. But I found it well marked in case of chrome steel.

Other but less marked liberations of heat during cooling, and also during rise of temperature, will be considered in § 257.

A. *The rise of temperature*, so marked as to force itself on the attention of several observers independently, is readily detected by watching in a dark place the gradual cooling of a flat high-carbon steel bar, which has been highly heated at one end. The color does not die out gradually, as in the case of a bar of platinum, copper or wrought-iron (6 to 10, Figure 70), but we get the remarkable phenomena observed by Brinnell and shown in 1 to 5,

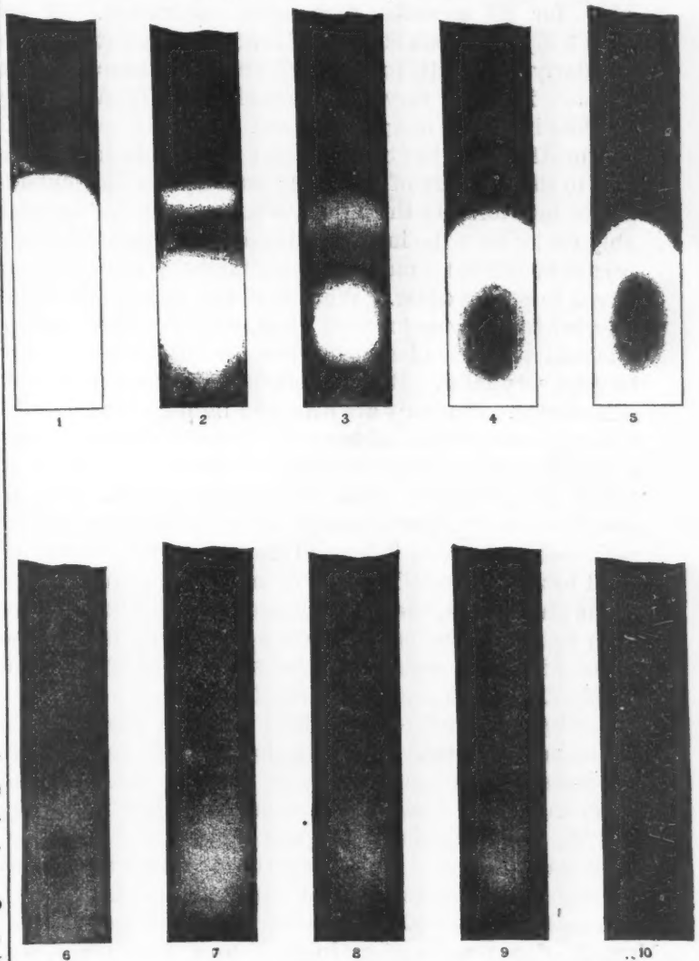


Fig. 70.

Appearance during slow cooling of a bar of tool steel heated at one end. Brinnell.

Figure 70. A bright band suddenly appears near the boundary between the yet-glowing and the non-glowing portions of the bar, and gradually spreads over the whole surface of the glowing region. This indicates that as the temperature of each point falls to a certain critical degree, probably V, it again rises. After this the color dies out normally, as in 7 to 10. The after-glow may also be detected by comparing in a dark place the appearance during cooling of a wrought-iron and of a high-carbon steel bar, initially at the same temperature. The cooling of the steel first outstrips that of the wrought-iron: but soon the wrought-iron overtakes the steel, which indeed brightens visibly.

Barrett has proved that there is an actual increase of thermal as well as of luminous radiation[d] at the critical point in case of cooling steel.

C. *The actual expansion* which accompanies the after-glow has been detected by Gore,[e] Barrett,[f] and Coffin,[g]

* Copyright by the Scientific Publishing Company, 1887.

[a] Trans. Am. Soc. Civ. Eng., XV., p. 324, 1887.

[b] T. R. Almond, Trans. Am. Soc. Mech. Eng., IX., p. 151, 1888.

[c] Discussion of a paper on manganese steel, excerpt Proc. Inst. Civ. Eng., XCIII., p. 116, 1887-8.

[d] Phil. Mag., XLVI., p. 476, 1873.

[e] Phil. Mag., XXXVIII., p. 59, 1869.

[f] Idem, XLVI., p. 472, 1873.

[g] American Machinist, Jan. 15th, 1887, p. 4.

and has set hundreds or thousands of mill-men puzzling over the numerous reversals of curvature of rails on the hot-bed.[a] Coffin found that the retardation of contraction increased greatly with the proportion of carbon. A four-foot bar, with 0·90% of carbon, in cooling from an orange contracted $\frac{1}{8}$", re-expanded $\frac{1}{32}$", then again contracted $\frac{9}{16}$": a similar bar with 0·17% of carbon contracted pretty regularly during 45 seconds, then ceased to contract measurably for 20 seconds, then again contracted. A bar with 0·07% of carbon contracted continuously but not quite regularly. Barrett, too, though unable to detect this expansion in some very soft wrought-iron, found it very marked in hard wrought-iron, and especially so in steel.

The after-glow has been referred to an evolution of heat due to the pressure of the more rapidly cooling outside on the interior. In thick bars, whose outside is appreciably cooler than the inside during cooling, the after-glow occurs somewhat gradually, and might possibly be referred to such a cause. Were this the true cause, however, when we come to small wires, whose outside and inside cool at nearly identical rates, the after-glow should become very faint. But it is precisely in these that it is remarkable. Not only are heat and light evolved, but the wire expands with a sudden *jerk* when the cooling reaches a certain point. Barrett, using a multiplying index to follow the movement of the wire, which was heated by an electric current, reports among other tests "wire bright red: contact broken, index fell from 32 to 20, jerked forward to 24·5, then fell to 4: wire cold." The suddenness of the phenomena, the actual expansion and other features seem to show conclusively that some molecular change occurs within the metal, and that the recalescence is not simply due to the pressure of shell on core.

D. *Coffin's Bend.*—Coffin finds that the change from hardening to cement carbon in slow cooling past V, like the same change on heating to a straw tint, and like the change from cement to hardening carbon in heating past W, is accompanied by a great depression of the transverse elastic limit. In an experiment which he carried out with my assistance, a steel bar four feet long and $\frac{5}{8}$ inch square, with 0·67% of carbon, was heated on the level hearth of a reverberatory furnace to a low yellow, say W, then removed, supported at its ends in the outer air, and loaded in the middle with 7·5 pounds. During the first 90 seconds after removal it did not bend perceptibly: in the next 35 it bent 1·5 inches, and then stopped bending altogether. The bending began and ended gradually. In several other experiments we found that the deflection was proportional to the theoretical deflecting power of the loads. In one case a $\frac{3}{4}$ inch steel bar, four feet long, with a load of 7·5 pounds in the middle, began bending 135 seconds after leaving the furnace, and bent 0·3 inch between the 135th and the 250th second: a load of about 150 pounds applied 30 seconds later produced no further deflection that we could detect with our rough appliances.[b]

Finally, the total deflection under given load appears to be the same whether the temperature descend rather rapidly or extremely slowly past the critical range.

In straightening railway axles Coffin takes advantage of this temporary increase of flexibility, by applying to the axle's convex side, while the temperature is *falling* past V, a very gentle pressure, one which would not bend the axle if after cooling it were *reheated to* V.

[a] Sweet, Trans. Am. Soc. Mech. Eng., VII., p. 154, 1886.

[b] These experiments will be described in the Technology Quarterly, Volume II.

E. The magnetic and thermo-electric properties undergo changes opposite in sign to those which occur in heating past V. A cooling iron wire in contact with a magnet and surrounded by a coil of copper wire induces an electric current in this wire as its temperature passes some point which is at or near V.[c]

It is noteworthy that neither this last phenomenon nor the expansion, the evolution of heat nor the momentary depression of the elastic limit occur in cooling past V, unless the temperature has previously been far above V, presumably at W[d]: nor do the carbon-condition, the fracture and the hardening power change in cooling past V, unless the temperature has just before reached W.

Moreover, some at least of these phenomena which occur at V are much more intense in cooling than in heating. Thus, the increase of magnetizability in cooling, though indeed composed of three successive steps, has one which is much more sudden and violent than any which occurs during heating[e]: the expansion at V during cooling is much greater than the contraction during heating. Gore, indeed, could detect no contraction[f]: in two experiments of Barrett's the expansion in cooling seems to have been about thrice as a large as the contraction on heating.[g] This accords with the fact that marked changes in the hardening power, the fracture, and the condition of carbon have been detected at V in cooling (from W), but not in heating.

§ 257. Thermal Phenomena during Heating and Cooling; α and β Iron.[h]—Digressing, let us consider the interesting theories of Osmond and Werth, and, to that end, note the thermal phenomena which occur when iron is heated and cooled. These are represented graphically in Figure 71. If a bar of unhardened steel be heated say to 500° C., and be then allowed to cool gradually, losing heat by radiation, and if we plot successive degrees of temperature as abscissæ and the intervals of time occupied in cooling from each degree to the next lower as ordinates, we obtain smooth curves, rising regularly as, with nearer approach to the temperature of the atmosphere, radiation becomes slower. But like curves plotted for cooling from higher temperatures are extremely irregular, showing that at certain temperatures either the specific heat changes abruptly, or, as seems more probable, some change occurs within the metal, accompanied by absorption or emission of heat. Like irregularities occur during gradual heating.

Heat liberated { retards cooling, raising the cooling curve locally. / hastens heating, lowering the heating curve locally.

Heat absorbed { hastens cooling, lowering the cooling curve locally. / retards heating, raising the heating curve locally.

(TO BE CONTINUED.)

[c] Phil. Mag., XXXVII.

[d] Idem, XLVI.

[e] Gore, Phil. Mag., XL., p. 174.

[f] Idem, XXXVIII., p. 62.

[g] Idem, XLVI., p. 474.

[h] Ann. Mines, 8th Ser., VIII., p. 5, 1885. "Transformations du Fer et du Carbone dans les Fers, les Aciers, et les Fontes Blanches," Osmond, Paris, 1888, Stahl und Eisen, VI., pp. 374, 539, 1886: Idem, VII., p. 447, 1887: Idem, VIII., p. 364, 1888. Comptes Rendus, CIII., pp. 743, 1135: Idem, CIV., p. 985. Cf. Müller, Stahl und Eisen, VIII., p. 291, 1888. Also Ledebur, Idem VI., p. 374, 1886: VII., p. 447, 1887, VIII., p. 364, 1888.

Correction.—In a foot note on pages 308–9 of this journal, October 13th, 1888, I criticise a statement and a suggested theory of Mr. Wm. Metcalf's. I since learn that I had not caught his meaning clearly, and, pending further study of the matter, I withdraw lines 4 to 14 and 24 to 42.

P. 397, first column, Nov. 10th, line 3d, the reference [a] after "reversed" should be [aa] to "Osmond," etc.

In the foot note the reference letter [a] should apply only to "Barrett, Phil. Mag. XLVI.," etc.

The reference letter to "Osmond, Transformations," etc., should be [aa].

In line 8 of the foot note *for* a_{c1} *read* a_1.

PERSONAL.

Mr. F. L. Bartlett, engineer and chemist, of Portland, Maine, will shortly visit Colorado, Utah and Nevada.

Judge A. J. Elder, interested in many Montana properties, died at Boulder, Mont., last week, aged fifty-eight years.

Col. Matt. Graham, general manager of the Silver Mountain mine, Boise County, Idaho, has gone to London, England.

Mr. Thomas H. White, of Deadwood, Dak., has been appointed superintendent of construction of the Deadwood Central Railroad.

Mr. F. Z. Shellenberg, Superintendent of the Westmoreland Coal Company, at Irwin, Pa., has resigned, and is succeeded by George Scull.

Mr. Frederick Prime has been made president of the Clifton Iron Company, owning and operating the furnaces at Jenifer and Ironton, Ala.

Dr. David T. Day, of the U. S. Geological Survey, Department of Mineral Statistics, is now in Utah to inquire into the mineral resources of that Territory.

The Thomson-Houston Electrical Company has presented two of its dynamos to the electrical engineering department of Cornell University at Ithaca, N. Y.

Col. John D. Morrisy, manager of the Sylvanite Mining and Milling Company of Gunnison County, Colorado, is at present in New York, making arrangements for the development of the company's property.

Mr. J. B. Ford has retired from active connection with the well-known publishing house in New York which, first as J. B. Ford & Co., and for ten years past as Fords, Howard & Hulbert, has been associated with his name.

Mr. William Dean, Sr., died at his home in Mingo Junction, Ohio, on the 5th inst. In 1850 Mr. Dean organized the La Belle Iron Works and afterwards became identified with the Jefferson Iron Works, of Steubenville, Ohio. He was also interested in the Mingo Iron Works.

A mineralogical section of the Brooklyn Institute, Brooklyn, N. Y., has been formed. It is the intention of this club to hold semi-monthly meetings for the practical study of minerals, the examination of specimens and collections, and the presentation of papers on scientific subjects.

The Secretary of War has detached Major Benyaurd and Major Heuer, now stationed at San Francisco, Cal., and Major Hanbury, at Portland, Or., as commissioners to investigate the mining débris question under the Biggs bill, which was approved by the President on the 1st of October.

Mr. Ivan C. Michels, the statistician of the United States Senate Committee on Mines and Mining, has been commissioned to prepare a report on the silver question. He is now in the West, and will visit Colorado, Nevada and California, Arizona and New Mexico, before he returns to Washington in January next.

Mr. J. Parke Channing has been reappointed as one of the mine inspectors of Michigan. This is but the deserved recognition of the faithfulness and ability with which he has discharged the duties of the position the past year, the former restriction forbidding Mr. Channing to hold any other salaried position being removed.

The first annual convention of the Boiler Inspectors and Stationary Engineers' Association will be held in Pittsburg, Pa., next week. The convention will discuss the inspection service and plans for the protection of life and property, and arrange for a uniform system of inspection throughout the country, and, if possible, take means to prevent the sale of worthless boilers to ignorant people.

Mr. Miles A. French, for two years in the employ of the Bridgeport Copper Company, at Bridgeport, Conn., as a boss melter and refiner, it being his duty to extract the silver from copper ore and from the slag, was arrested on the 10th inst., for taking silver which amounted to $20,000. When Mr. French was arrested, seven silver bricks, valued at about $2000, were found in his hand-bag.

The United States Association of Charcoal Iron Workers will hold their ninth annual meeting in New York, commencing December 5th. The headquarters will be at the Oriental Hotel. It was the intention to hold this meeting at Anniston, Ala., but the death of Mr. Samuel Noble, the President of the Association, and the presence of an epidemic in some of the Southern States caused the Executive Committee to consider it advisable to abandon this idea.

The reports presented to the convention of the Knights of Labor, in Indianapolis, Indiana, held this week, showed that, according to the receipts from tax, the membership has decreased about 300,000 during the fiscal year, and at the present time the receipts are not sufficient to meet the necessary expenses. The Treasurer thinks that a reduction of $25,000 in the expenses could be made without detriment to the order. The property of the order is valued by the General Secretary at $114,649.05. The membership on July 1st was 259,518 in 5666 local assemblies.

INDUSTRIAL NOTES.

The Glendale Rolling Mill, near Reading, Pa., resumed work on the 14th inst.

It is reported that parties will build a 60-ton iron furnace at Jasper, Ala., if a bonus of $10,000 is raised.

It is reported that the Leeds Land Company is negotiating with Mr. H. F. DeBardeleben for the immediate erection of a furnace at Leeds, Ala.

The St. Paul Iron Company, of North St. Paul, Minn., has made an assignment. The liabilities are estimated at $30,000; assets not yet known.

A large addition is to be made to the works of the Newcastle Wire Nail Company, at Newcastle, Pa. The company will also build a steel rod mill.

The railroad department of the steel mill of the Bethlehem Iron Company, at Bethlehem, Pa., started up on the 14th inst., after several weeks' idleness.

The large No. 2 blast-furnace of the Brooke Iron Company, at Reading, Pa., which has been idle since last January, went into operation on the 12th inst.

The Bessemer Iron and Steel Company, Bessemer, Ala., has issued the $500,000 of bonds for building its two iron furnaces, upon which work has been commenced.

The erection of the buildings for the Minnesota Car Company at West Duluth, Minn., is being pushed vigorously. These works are to be ready for operation next spring.

The Gem furnace and valuable iron and other property in Virginia will be sold at public auction on the premises of the Shenandoah Iron Company, at Milnes, Va., on December 6th.

The Philadelphia & Reading Coal and Iron Company will resume work at its large furnace at Bechtelsville, Pa., which has been idle for some months. Other of the company's furnaces will resume work as fast as they can be repaired.

The extensive works of the Steam Gauge and Lantern Company, in Rochester, N. Y., were destroyed by fire on the 9th inst., and at least twenty persons lost their lives. The pecuniary loss is placed at $250,000. The company announce that the works will be rebuilt at once.

The managers of the Spearman, Douglass & Mabel and Claire furnaces, at Sharon, Pa., have raised the wages of their employés 15 cents per day. The prospects are that all the furnaces will be in blast all winter. The Henderson furnace will resume shortly after a long idleness.

The Link-Belt Machinery Company, of Chicago, Ill., has begun the erection of its new foundry, to be located on its five and a half acre tract at Thirty-ninth street and Stewart avenue, Chicago. The structure will be 286 feet long by 87 feet wide, and will probably be completed before spring.

Messrs. Queen & Co., of Chestnut and Sansom streets, Philadelphia, have issued a new catalogue of mathematical and engineering instruments and materials, which is very complete, and illustrated with the usual clearness which has long distinguished the publications of this firm.

The Sheffield & Birmingham Coal, Iron and Railroad Company, of Sheffield, Ala., last week shipped from its furnace B two trains, carrying in all about 400 tons of foundry iron, to a large concern at Pittsburg, Pa., where it will be used in the manufacture of articles of hardware, etc.

The Baxter Stove Works, at Birmingham, Ala., have been purchased by Frederick Sloss. He will build at once, it is said, a sixty-ton furnace. He is interested in a rolling mill and will build another for making structural iron. He intends that these mills, with his stove works, shall consume the product of his furnaces.

The influence of the high prices of copper in stimulating work at the copper mines is shown in the large orders that come from the Chili copper mines for American machinery. The Rand Drill Company of this city has sent fifteen rock drills to Chili for use in the mines there, and other orders are coming forward.

The Treasury Department has authorized the allowance of drawback on exported Hungarian nails manufactured at South Hanover, Mass., wholly from imported steel shearings or steel-plate scraps. The drawback is to be equal in amount to the duty paid on the imported material, less the legal retention of 10 per cent.

The National Tube Works Company, McKeesport, Pa., has completed a contract for furnishing the Philadelphia Company with eight miles of 20-inch pipe, used in making another big main from the Murraysville field. The contract required over 16,000 tons of iron, and the pipe was made in the company's 24-inch mill.

A New York, Canadian and English syndicate have purchased the Isle au Heron, in Lachine Rapids, River St. Lawrence, for the purpose of developing waterpower for furnishing electrical power and lighting for Montreal. The building of the necessary dams, bridges, etc., is to be commenced at once. The improvements will cost $500,000.

It is stated that the German coke producers of the Western coal-field have formed a syndicate patterned after the Pennsylvania Coke Producers' Association, to which we referred in our issue of November 3d. It now controls 90 per cent of the production and 6 per cent more will be added on the 1st of December. The syndicate on November 1st advanced prices from $1.75 to $2.25 per ton. This is equal to the price in Belgium and is $1 higher than the Connellsville fuel.

Messrs. Park Bros. & Co., of Pittsburg, Pa., have organized the Commonwealth Telegraph Company, the object of which is to own and control private telephone lines between the Black Diamond Steel-Works and the gas wells in the Murraysville field. This has become customary to all large manufacturing concerns. They secure the gas from certain wells from the Philadelphia Company, and then have the flow carefully watched, in order that they may not be caught short and lose any heats of steel by reason of an unexpected stoppage.

Iron workers in several large mills at Pittsburg, Pa., threaten to strike. On account of a shortage of natural gas during the daytime, the gas companies have requested the mill-owners to arrange the working hours so that the heaviest work will be done at night, in order that the consumption of gas can be made more uniform. The manufacturers agreed to the change, but their employés at meetings of the various amalgamated lodges throughout the city, on the 14th inst., resolved to strike against any change in the "turns." They are willing to accommodate the mill owners but not the gas companies.

The Frisbee-Lucop Mill Company, of New York, has furnished mills for phosphate grinding to the following well-known firms: Troy Fertilizer Company, Alabama; Davie & Whiffle and Berkeley Phosphate Company, Virginia; Commercial Guano Company and Hammond Hull & Co., Georgia, and Geo. W. Grafflin, Maryland. For cement to Hugh N. Camp & Son, Pennsylvania; Portland Cement Company, Oregon; and for slate, to Lancaster Slate Company, Massachusetts. The company has now a record of more than sixty mills at work on phosphates and cement rocks, besides a great many on ores, carbons and various other materials, and the number is being constantly increased.

Messrs. H. K. Porter & Co., of Pittsburg, Pa., have received an order from the Japanese Government for two Mogul 42-inch gauge locomotives to be used on the Paranai Railroad, in the Island of Yesso. This line is of the narrow gauge standard adopted by English engineers for India and some of their other colonies. H. K. Porter & Co. are the first locomotive builders in the United States who ever sent an engine to Asia. Formerly English manufacturers had the exclusive trade, although later on some French locomotives were sent there. Their first consignment was in 1880 for two locomotives; the second, May, 1881, for two locomotives also; the third, May, 1884, one locomotive; the fourth, January, 1885, two locomotives. The present order will be completed by February, 1889, and shipped.

The Thomson-Houston electric railway between Omaha and Council Bluffs has been opened for general passenger traffic, and is now operating satisfactorily. The road is 9 miles in length and at present is operating 16 motor cars and 16 cars without motors, each motor car hauling one of the others. The cars are made by the Pullman Palace Car Company, and are connected by the vestibule device, in use for the first time here on street railway cars. They are very popular. Although the motors work equally well in either direction, a loop is made at each end of the track so as to permit the motor car to always be ahead. This road opens a new means of rapid transit between Omaha and Council Bluffs, which is highly appreciated by the residents of the two cities, they having been previously compelled to travel by special trains on the Union Pacific Railroad, which ran once an hour and charged 25 cents. The fares upon the new line have been reduced to the usual street railway rates.

Great credit is due Mr. T. J. Evans and his associates in carrying through this entire project of rapid transit between the cities, they having expended not less than half a million dollars in constructing a magnificent bridge, 3000 feet in length, over the Missouri River. The neatness and simplicity of the overhead construction are greatly admired.

Within the past few days the new Thomson-Houston railway at Wichita, Kan., has been put in operation, and is working successfully.

The electrical equipment of a portion of the Lynn & Boston road, running through the most thickly settled part of Lynn, which has been furnished by the Thomson-Houston Company, will be put in operation during the present week. The overhead construction upon its line is greatly admired. In the construction of this road many difficult problems were met with and successfully worked out. The road has many curves and grades, as high as 12 per cent, making the construction work exceedingly difficult.

The Derby Horse Railway Company, Ansonia, Conn., operating with the Van Depoele electric system, is about to increase its equipment by the addition of considerable Thomson-Houston apparatus.

The Third Ward Railway Company, Syracuse, N. Y. (Thomson-Houston system), is to be started during the present month. The equipment and overhead construction are very fine.

The electrical equipment furnished by the Thomson-Houston Company for the Broad Gauge Street Railway Company, Des Moines, Iowa, is almost ready to be put in operation.

Work is progressing rapidly for the installation of the Thomson-Houston plant at Topeka, Kansas. This road, when put in operation, will be the largest electrical railway in the world, being 14 miles in length.

Arrangements are being made to rush the construction and equipment of a new Thomson-Houston electric railway at Alliance, Ohio, and it is proposed to have the line in operation within a few weeks.

The electrical equipment of the Hoosac Valley Street Railway, North Adams, Mass., under the Thomson-Houston system which it has been intended to defer until next year, will now probably be completed this season.

CONTRACTING NOTES.

Our list of machinery and supplies wanted will be found on page xiv. Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on the same page. This week, proposals are invited for the following new contracts: No. 1170, Electric Light Plant; No. 1171, Steel Gun Forgings for Ordnance Dept. U. S. Army; No. 1172, Boring Artesian Well; No. 1173, Construction of Breakwater and Furnishing Rubble Stone, etc.; No. 1174, Dredging; No. 1175, Excavating; No. 1176, Dredging in seven different Localities; No. 1177, Construction of Breakwaters; No. 1178, Extension of Dike; No. 1179, Dredging; No. 1180, Dredging; No. 1181, Dredging.

The contract for the construction of the Sault Ste. Marie Canal has been awarded to Messrs. Hugh and John Ryan, of Toronto and Brockville, Ontario. Associated with them are M. J. Haney & Co., of Watertown, N. H. The amount of the contract is $1,200,000. It is stated that a number of American contractors, who came to Ottawa in connection with the award, are indignant over the fact that their tenders, although the lowest, were not accepted.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including November 7th, as reported by the Marquette *Mining Journal*, were as follows:

	Tons. 1888.	Tons. 1887.
Marquette, Marquette District	779,648	784,593
St. Ignace, " "	106,820	88,795
Escanaba, " "	774,685	832,248
" Menominee District	1,038,666	1,084,378
" Gogebic District	191,107	.....
Ashland, " "	981,482	1,021,742
Two Harbors, Vermillion District	408,819	380,196
Total tons	4,279,227	4,191,952

ALASKA.

ALASKA MILL AND MINING COMPANY.—According to the report of Governor Swineford, of this Territory, to the Secretary of State, the estimated production of gold from the Treadwell mine is $150,000 a month, which is much higher than is stated by our correspondent "Californian" in our issue of October 27th.

ARIZONA.

COCHISE COUNTY.

HEAD CENTRE VS. TRANQUILITY.—The suit between the Head Centre Company and Tranquility will be decided by the Supreme Court of California next February. This suit is for a distribution of stock, after which there will be a resumption of operations on these properties, which now belong to the Contention Company.

PIMA COUNTY.

PEERLESS MINING COMPANY.—The first bar of bullion has been produced. Operations are being pushed vigorously. There are sixty-five men at work now, and it is expected to have double that number at work by December 1st.

CALIFORNIA.

BUTTE COUNTY.

AURORA.—William J. Hamond, of Pittsburg, has begun a suit in the Superior Court at Chicago against Francis E. Hinckley for $65,000. The suit grows out of an alleged breach of contract made about a year ago in relation to the working of this gold mine.

MONO COUNTY.

HOMER CONSOLIDATED GOLD MINING COMPANY.—Dr. A. B. O'Connor and George W. Butterfield, representing this company, of London, have been inspecting the property and arranging for its development on an extensive scale.

NEVADA COUNTY.

COE MINING COMPANY.—The company is said to have made an arrangement which will, according to the Grass Valley *Tidings*, result in the development on an extensive scale of the company's property, situated just outside the northern boundary of the municipal incorporation. Parties from Denver, Colo., are interested in the enterprise. The arrangements made stipulate that development work shall be instituted without delay, and that the bond shall endure for one year; a 20-stamp mill with all the latest improvements is to be erected within the same period, at the expiration of which the Denver manipulator is to receive without further cost 55,000 of the 100,000 shares comprising the Coe Company's capital stock. And shall he so desire, he may at that time purchase the remaining 45,000 shares at the rate of $1.50 a share. In the event of non-compliance with any of these terms, all improvements made are to revert to the company. There is now a water-power hoisting and pumping plant on the Coe, and all that is necessary to afford resumption of development work is to put the machinery in order and pump out the mine.

PITTSBURG.—A new ten-stamp mill, containing the latest improved machinery, is to be erected. Underground work in the mine will be systematically carried on, and additional depth of shaft for 300 feet will be made as soon as possible.

SIERRA COUNTY.

BUFFALO.—The mill machinery has all been delivered, and is being set up. There are about 1000 tons of ore on the dump. The developments in the mine look favorable. No. 1 tunnel is run on the vein 350 feet. No. 2 tunnel is in a distance of 200 feet, and the vein in that quarter is looking splendidly. The tunnel on the south side of the creek has been run 60 feet. When this tunnel reaches into the hill 500 feet it will have a depth of 800 feet from surface.

MARGUERITE.—The work of draining the mine has begun. The 20-stamp mill is being put in shape, and as there is some ore on hand it will be started up at once. As soon as the mine is pumped out a force of men will be placed underground in making developments and taking out ore. Among various other needed improvements about the mine is a new building, furnaces and complete assaying outfit.

COLORADO.

CENTRAL MINING AND MILLING COMPANY.—This company has let a contract upon the Shakespeare, in Crystal Basin, to Archie McLeod, and he is making active preparations to push work all winter. This property shows up a body of copper ore, but has not been worked for some time. It is also reported that the concentrator at Elko will be put in shape to treat ore early next spring.

JACK-WHACKER.—This claim, located on the Whitehouse mountain contact, has been sold to Mr. W. C. Wynkoop, of Denver. This property was only discovered last July, and with a couple of prospect holes shows up a rich lead carbonate ore from the surface. It is the intention of Mr. Wynkoop to do some work this season, and push operations in the early spring.

GUNNISON COUNTY.

SYLVANITE MINING AND MILLING COMPANY.—E. E. Burlingame, of Denver, under date of October 24th, submits the following assay: First level, silver, $723.86, and traces of gold; upper level stope, $1183; tunnel level, $239.80; shaft, $179.60; engine level stope, $88 40. Numerous other assays have been made by the Denver Public Sampling Works with an average result of $160 per ton.

HINSDALE COUNTY.

GOLDEN FLEECE.—Work is to be resumed on this property, which first started the boom in this county, and the building of Lake City. The mine was discovered in 1874. New York parties became interested and a company was organized. In a short time the ore gave out, and it was found to be only a pocket. When the vein was lost after a fruitless search to find it, the mine was shut down. The company refused to pay the men and the mine was sold at Sheriff's sale under a mechanic's lien and bought in by Geo. Wilson, one of the creditors for the costs in the suit. Then a law suit was commenced by the former owners to set the sale aside and recover possession and the case dragged through the courts for years, till finally the property was abandoned and re-located as the Golden Fleece by its present owners. Since then very little has been done on the propery. It has been worked occasionally under lease and small shipments of ore have been taken out from time to time, but very little development work has been done.

PEARL.—Negotiations are pending for the sale of this mine at Cascade to English parties, and Mr. Charles Fullenwider has gone to England to conclude arrangements for the transfer.

LAKE COUNTY.

DINERO MINING AND MILLING COMPANY.—Work has been resumed under the management of Mr. Langhorn, the company having subscribed money for more prospecting work. A small force of men is now engaged in the mine, cleaning out old drifts and other workings, in preparation for systematic exploration work in the vein. The most important thing to be done will be the driving of the third level north, to cut the continuation of a rich ore chute which has been already cut by three levels, and has been stoped continuously between them. This ore chute, like all others in the mine, has a northward dip in the vein, and in fact that is the usual course of the ore in nearly all of the Sugar Loaf veins.

IRON SILVER MINING COMPANY.—The concentrating mill has been shut down and will probably not be started again before next summer. The mill has been run lately on low-grade ore from the old Iron mine.

LITTLE PITTSBURG MINING COMPANY.—Mr. E. C. Gilman, the General Manager of the Little Pittsburg Mining Company, of Leadville, is in the city. The Little Pittsburg was sold some time ago, as we mentioned at the time, to satisfy a judgment obtained against it by the Little Chief Company. The personal property of the company was purchased by Mr. E. C. Gilman, the General Manager of the company, who is still in possession of the mine. The time for redemption extends until next February, and it is thought that before the opportunity to redeem the property expires the company will be reorganized. In the meantime the old workings of the mine are in the possession of tribute workers, who are gleaning through the stopes, and paying enough in royalties to meet the current expenses of the company.

RED HOOK MINING AND MILLING COMPANY.—The Red Hook and Nellie, on Sugar Loaf, purchased some time ago by this company for $4500, was sold recently at sheriff's sale for $1000, to satisfy an indebted-indebtedness of $25,000 held against the property by the original owners and secured by a deed of trust. The company paid $20,000 down on the property, and gave notes secured by the prospective bonanza for $25,000 with the foregoing result. The mines are now in the possession of James T. Horton, W. W. Coble and others, the original owners.

LAS ANIMAS COUNTY.

SANTA FE MINING COMPANY.—A terrible explosion occurred in the new shaft of this company's coal mine at Starkville, last week, instantly killing two men, the only ones in the mine at the time. For some reason the pumping of air into the mine had been stopped and the explosion was caused by an accumulation of gas. This is said to be the first explosion of gas that has ever occurred in the mines of this region.

PARK COUNTY.

LONDON MINING COMPANY.—The London mine, says the Fairplay *Flume*, has been completely closed down, the pump having been taken up and the employés all discharged, with the exception of a watchman at the mine and mill. The men who were discharged report that the mine never looked better.

PHILLIPS GOLD MINING COMPANY.—The company is making about two car-loads of concentrates daily, shipping the high-grade to the smelter and storing the lower grade material to ship only in five hundred or thousand ton lots.

PITKIN COUNTY.

THE ASPEN MINING AND SMELTING COMPANY.—This company has opened offices in this city and has just declared its first dividend of twenty cents per share, or $40,000. The capital stock is $2,000,000, divided into 200,000 shares of $10 each, the stock being non-assessable. The officers of the company are J. B. Wheeler, President; R. S. Holt, Vice-President; S. S. Earle, Treasurer; Jas. L. Tilton, Secretary. The directors are: J. R. Busk, W. D. Sloane, R. S. Holt, J. B. Wheeler, J. F. Sutton, W. L. Heermance, S. S. Earle, all of New York City; T. M. Davis, Newport, R. I.; J. J. Hagerman, Colorado Springs, Colo.; H. K. Devereux and F. J. Bulkley, both of Aspen, Colo.

The general manager is Fred G. Bulkley, the Colorado State geologist. To a representative of the ENGINEERING AND MINING JOURNAL, Mr. J. B. Wheeler, the President of the company, said: "This company was organized in 1885, and during 1886 and 1887 a great deal of development work and some mining was done, but no ore could be shipped because of the lack of transportation facilities. Consequently, the opening of the present year found us $400,000 in debt; but at the same time the tide began to turn, for in February a railroad was completed, which gave us ample shipping facilities. We then commenced to work in earnest, so that to-day we have paid the debt of $400,000, have declared a dividend of $40,000, and still have $50,000 in the treasury. Yes; I mean to say that $490,000 represents our net profits for the year. The official report to be issued December 1st will show the exact figures. Our mining and milling plant is one of the most economical in the country, and ours is the only mine of any kind that possesses an electric hoist.

"The stock will probably be listed on one of the New York exchanges simply to give it a market value; it is, of course, all sold, and indeed I do not know of any one who would part with a single share. We own the following mines: Star, Washington, Emma, Aspen, Mammoth, Vallejo, Golconda, Way Up, Robert Emmett, General Shields, Hidden Treasure, Chance, Millionaire, Banner, and Betsey Jane."

SAN MIGUEL COUNTY.

UNITED STATES GOLD PLACERS.—Mr. W. J. Madden, Superintendent, states that about $150,000 has been expended so far in the development of the property. The coming year another $150,000 will be laid out in extending the present ditch to some bars still lower down the river. About the 25th of this month a clean-up will be made. This clean-up will be from the high bar, which has been opened up recently. During the winter a tunnel will be run below the rimrock under this high bar, so as to allow of washing from the lowest point. The tunnel will be about 400 feet long, 5 feet by 7½ feet.

SUMMIT COUNTY.

JUMBO MINING AND MILLING COMPANY.—The Board of Directors of this company, at a recent meeting, decided to move the old machinery to the mouth of the mine and add some new machinery. The scarcity of water will thus be overcome, as the tunnel at the 1000-foot level drains the entire mine and furnishes an abundance of water to run the mill steadily. The ore on the dump will be milled, while the development of the property will be continued. In our issue of August 11th we referred to the financial difficulties of the company.

LITTLE MOUNTAIN MILLING COMPANY.—The financial difficulties of this company have not been adjusted, but a portion of the equipment of the mill has been sold and removed, and the remainder is in the toils of a suit at law, the outcome of which is hard to predict Meanwhile the mine, said to be one of the best producers of the camp, lies idle.

DAKOTA.

LAWRENCE COUNTY.

The furnaces of the Silver Queen smelter at Galena have started up. The bins are full of ore received from the Queen, Horseshoe, Bullion, Ontario, Hayes and other properties.

CALEDONIA GOLD MINING COMPANY.—The mill since its enlargement to sixty stamps is turning out about $35,000 a month. The ore is of improved quality, and the outlook is promising.

IRON CITY MINING COMPANY.—The mines of this company, located on False Bottom, are to be thoroughly prospected with a diamond drill until next spring. It is said that the company has already discovered with the drill a 13-foot vein of high-grade ore, and it will now run across the formation to determine what is in the rear of them. Pittsburg parties are interested in the stock.

SILVER PLUMAS MINING COMPANY.—This company has been added to the list of companies producing gold bullion with monthly regularity. Operating only a twenty-stamp mill, the September clean-up amounted to $7800. That for October is valued at $8000, representing operations for only twenty days of last month.

KANSAS.

CRAWFORD COUNTY.

A frightful mining disaster took place on the 9th inst. at Frontenac, a suburb of Pittsburg, in this county. When the men were preparing to leave off work at shaft No. 2, a terrible explosion was heard which shook the earth for a great distance and completely shattered the shaft. The loss of life, though bad enough, being about 40, is not nearly so great as was at first reported. The superintendent, Mr. W. W. Allen, and Mr. Findlay, mine inspector, coincide in their views that the explosion was caused by coal dust ignited by firing a shot. Pittsburg is in the center of the coal mines of southeastern Kansas, and is about 100 miles south of Kansas City, on the Fort Scott & Gulf road.

MICHIGAN.

HANCOCK IRON COMPANY.—This company is reported to have struck rich gold quartz in its shaft, on section 16, town 47, range 31, in Baraga County, six miles from Michigamme.

HURON LAND AND MINING COMPANY.—At the recent annual meeting the following gentlemen were elected directors for the ensuing year: Jas. Mercer, J. Burtenshaw, T. H. Emmons, Jos. Vogtlin and R. A. Parker. Jas. Burtenshaw was elected President and R. A. Parker Secretary and Treasurer.

COPPER MINES.

CALUMET & HECLA MINING COMPANY.—The well-known suit of J. H. Chandler vs. the Calumet & Hecla Mining Company came up in the United States Court at Marquette on the 15th inst. It was brought to recover possession of a large part of the land on which the great mine is located. Judge Severens took the case away from the jury and decided against the plaintiff on the ground that the Calumet & Hecla title was good. The case will go to the Supreme Court.

[From our special correspondent.]

HOUGHTON, Nov. 10th.

COPPER FALLS.—Work at the Copper Falls mine, which is located in Keweenan County, about two miles from the Central, is running along smoothly. The monthly output is averaging 80 tons mineral per month. The Ashbed vein shows little change. The Owl Creek vein is still turning out some nice masses.

TAMARACK.—During last month No. 2 shaft was sunk eighty-eight feet. This is the fartest sinking in the history of the mine, and I believe in the United States. At No. 1 shaft, 10th level, drifting both north and south of winze on lode is being pushed, and is showing up good ground. Of the cross-cut at 10th level only about thirty feet remain to be drifte. During last month the cross-cut was drifted some two hundred and sixty feet.

TAMARACK JUNIOR.—No. 1 shaft is being sunk at the rate of about fifteen feet per week. The new boiler and engine house is completed, and the new engine ready for delivery. The spur track which leads from the main line of the Hancock and Calumet through the property, and runs to both No. 1 and No. 2 shafts, will be finished in a short time.

KEARSARGE.—The lode at the Kearsarge is looking well. The production of the mine is holding up well and from the present outlook promises to continue to do so.

TAMARACK-OSCEOLA COPPER MANUFACTURING COMPANY.—When the Tamarack-Osceola Copper Manufacturing Company was organized something over a year ago it was a question in the minds of many, notwithstanding its well-known financial backing and enterprise on the part of its projectors, whether they could make a success of the enterprise or not. The rolling mill which commenced active operations early in the spring has already proved from its large business during the past summer that it is not only there to stay, but the outlook has become so flattering that already several additions in machinery, rolls, furnaces, etc., have had to be added. The mill is now crowded with orders. A shipment of 150 tons of wire rods has just been made. The sheet mill is kept very busy. A new furnace has just been added for the 108-inch rolls, and a set of 20 × 60 cold rolls is being erected. Much of the machinery for the new wire mill, which has recently been completed adjacent to the rolling mill, is already on the ground and the engines are expected daily. Steam will be supplied from the boilers in the rolling mill, to be conveyed through an overhead pipe. It will only be a matter now of a short time when the work of drawing wire will be started up. The walls of the new smelting buildings are completed, and the roof, which is to be of iron, has arrived and is now being erected. There are two buildings, setting back some little distance from the lake shore, the nearest one being about 250 feet distant from the projected dock line, and parallel to it, thus leaving sufficient room for a third building, which will probably be erected in the future. The buildings are of the same dimensions, being 80 by 130 feet. At present they will contain five furnaces, three being placed in the building next to the lake, and two in the other. These furnaces are to be somewhat larger than any heretofore used in the Lake Superior District. The cupola building will not be erected until next Spring. The works are so arranged that they can be duplicated on the opposite side of the spur track, extending from the main line of the Hancock & Calumet railroad to the rolling mill, which allows for a layout of six furnace buildings in all.

IRON MINES.

EAST ANVIL.—This property will hereafter be known as the Dangler, Messrs. Dangler, Corrigan, and other Cleveland parties having obtained control of the property. Machinery is being put in position, and operations will soon be in full blast again under the management of Capt. Harry Pearce.

MONTANA.

CHOTEAU COUNTY.

The company operating the coal mines at Sand Coulee will very shortly be in a position to deliver 200 tons daily. After January 1st they will deliver between 400 and 500 tons daily.

SILVER BOW COUNTY.

The Boston & Montana Consolidated Copper and Silver Mining Company has made a most advantageous contract with the new smelting company for the treatment of its ore, making, it is said, $1½ a share per annum on its stock over present cost of smelting, which is very high. The smelting company has a capital of $1,000,000. The plant will cost $850,000. Smelting company will treat also the Butte & Boston ore. Although the contract with the latter company has not been made, it will be as favorable to it as to the Boston & Montana. Thus the two companies will be benefitted largely by the saving operations of the smelting company, while not incurring any risk in the enterprise or being charged with any deterioriation of the plant.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—This company made no report to its stockholders for the first fiscal year—ended June 30, 1888—as operations covered only nine months of that period and a detailed report was not considered necessary, but the following official statement of earnings and disposition thereof has been made up:

The product of matte was 14,565,867 pounds, yielding 59·44 per cent, and the product of shipping ore was 354,417 pounds, yielding 44·44 per cent, or a total of 8,815,987 pounds of refined copper, from which has been realized the gross sum of		$1,015,762.55
The costs have been:		
Interest	$671.52	
Expense account at New York and Boston	15,848.08	
Copper charges	22,513.71	
Refining charges	19,832.97	
Transportation	84,709.16	
Mining expense, 12 months	597,138.88	
Total running expenses for the year		740,714.32
Mining profit for the year		$275,048.23
Construction at mine and works	$153,453.16	
Mine and smelting plant	37,500.00	190,953.16
		$84,095.07
Cash received from sale of bonds:		
July, 1887	200,000.00	
Bonds in company's treasury	200,000.00	400,000.00
Balance of assets, July 1, 1888		$484,095.07

The Boston & Montana's product thus far in the current fiscal year has been as follows:

	Matte and ore. Pounds.	Refined copper. Pounds.
July	3,435,964	2,014,241
August	3,836,158	2,200,000
September	3,797,201	2,200,000
October	3,912,171	2,150,000
July 1st to October 31st	14,981,494	8,564,241
Add product nine months ended June 30th	14,920,284	8,815,987
Total since beginning of operations, 13 months	29,901,778	17,380,228

It will be seen that the product for the first four months of the current fiscal year is very nearly as large as the total for the preceding nine months. The mine began producing in September, 1887. Comparison may be interesting:

September—	1887. Pounds.	1886. Pounds.	Increase. Pounds.
Ore and matte	3,797,201	369,495	3,427,706
Refined copper	2,200,000	221,719	1,978,281
October—			
Ore and matte	3,912,171	434,100	3,478,071
Refined copper	2,150,000	256,119	1,893,881

In addition to the output of copper, 2886 ounces of silver and 802 ounces of gold were produced in October.

BUTTE & BOSTON MINING COMPANY.—The circular announcing the listing of this stock at the Boston Stock Exchange gives the following as the sworn statement of the company: Organized under the laws of Montana Territory for the purpose of mining, milling and refining ores, etc.; $1,000,000 first mortgage bonds issued on the property; paid for property, 199,964 shares, and $680,000 cash; expended on property, $1,366,000; amount paid in dividends to former owners, $785,612; capital, $5,000,000; number of shares, 200,000; par value, $25; assets—cash in bank, $320,000; 20,000 shares, par value $500,000; total, $820,000; officers: A. J. Davis, President; Stephen M. Crosby, Vice-President; D. L. Demmon, Secretary and Treasurer; and these with Joseph W. Clark, Albert S. Bigelow, J. A. Coram, Louis Strauss and Hiram Knowles, Directors. The principal office is at Butte City, Montana, and the office of registration is with the Massachusetts Loan and Trust Company, Boston.

LEXINGTON MINING COMPANY.—Official advices to us show that the production for October amounted to $14,784.01 in gold and $80,567.07 in silver, a total of $95,351.08, and for the ten months of 1888 a grand total of $911,070.87.

NEVADA.

EUREKA COUNTY.

EUREKA CONSOLIDATED MINING COMPANY.—During the week ending November 2d, 230 car-loads, averaging about $20 per ton, were taken from the Lawton shaft. About all the proceeds from this ore are expended for development and prospecting work, which is being done quite extensively. The smelting works are running steadily on custom ore, and it is estimated that the financial statement for October, which has not yet been issued, will show a surplus of over $15,000, against $9000 on September 30th. A supply of 1500 tons of coke, at $14 per ton, has been contracted for, and so it is not likely that smelting operations will have to be suspended because of a lack of fuel, as was once feared. We understand that efforts will be made shortly to induce the Richmond Mining Company to share in the expense of pumping out the Locan shaft, as was recommended by President Fries in the last annual report.

LANDER COUNTY.

AUSTIN IMPROVEMENT COMPANY.—This company has leased the Toiyabe, Isabelle, and London mines, at Austin. Mr. L. W. Getchell, a former resident of the Comstock, has been appointed superintendent, and will immediately begin the work of development on an extensive scale.

STOREY COUNTY.—COMSTOCK LODE.

We condense the following from the Virginia City *Chronicle*: The superintendents of the Comstock mines have filed statements of the ore and bullion yield during the quarter ending September 30th, 1888, with the Assessor of Storey County. According to these statements 28,316 tons of ore were worked, producing bullion of the assay value of $1,064,158. The total product of the Savage and Chollar mines is not included, but it will swell the total to $1,175,900. The total is about 945,000 below that of the preceding quarter, owing to a lack of ore-crushing facilities.

CHALLENGE CONSOLIDATED MINING COMPANY.—This mine produced 1248 tons of ore, yielding bullion valued at $24,170.81; average yield per ton, $19.75; total cost of extraction, reduction and transportation, $51,435.54; cost of production above yield, $27,265. No tax.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—The mine produced 30,126 tons of ore, yielding a total of $682,218.26 in bullion; average yield per ton, $22.75; actual cost of extraction, transportation, and reduction, $464,335; net yield above cost of production and subject to bullion tax, $117,883; total bullion tax on net proceeds, $3436.49.

HALE & NORCROSS MINING COMPANY.—The mine produced 6365 tons of ore, yielding bullion valued at $171,941.80; average yield per ton, $27; cost of extraction, transportation, and reduction, $141,065.72; net yield above cost of production and subject to bullion tax, $30,876; bullion tax, $926.

YELLOW JACKET MINING COMPANY.—The mine produced 1370 tons of ore, yielding bullion valued at $9765.36; average yield per ton, $7.25; cost of extraction, reduction, and transportation, $41,605; cost of production above yield, $31,930. No tax.

ALPHA CONSOLIDATED MINING COMPANY.—The assessment of 87½ cents per share, levied by this company, is on old Alpha stock, a few shares of which are still outstanding. The assessment of 25 cents per share levied by the Alpha Consolidated Mill and Mining Company, is on the stock of the new corporation, now listed and bought and sold at the boards in San Francisco.

ALTA MINING COMPANY.—An ore development has been made on the 900 level, which promises to prove important. A cross-cut has been advanced three feet in the ore and a Burleigh drill sent in six feet further showing ore the entire length. Some of this ore is high grade, assaying $500 per ton, while the average value is above the milling grade.

CONFIDENCE MINING COMPANY.—A number of dissatisfied stockholders have demanded an investigation of the affairs of the company. In an interview, Mr. Maurice Schmitt stated that the books of the company were in excellent shape, and would be ready for inspection very shortly.

During the past 18 months the company has sunk and raised 766 feet of winzes and upraises, and have driven 1,492 feet of drifts and crosscuts. At several points in the openings above the upper tunnel ore has been found that will pay to extract. From the upper tunnel down to the 48 level, and thence down to the 100 level the ore is continuous, as has been shown from the winze connections between these two levels. Some streaks of fine ore have been exposed on the 200 level, which are dipping east with a strong inclination to the south, and as the ore cut in the south drift on the lower tunnel dips in the same direction and is of the same character and quality, the mine is in good shape for the extraction of ore, and it is said there are many tons in sight which can be extracted and milled with profit when a proper milling plant is constructed at the mine. The mine produced 9207 tons of ore, yielding bullion valued at $176,065.93; average yield per ton, $19.25; actual cost of extraction, reduction and transportation, $156,975; net yield above cost of production and subject to bullion tax, $19,089; bullion tax, $572.62.

SAVAGE MINING COMPANY.—The mine is now producing about $1000 per day in bullion, and this yield will be largely increased when the ore from the new development on the 500 level is extracted.

SEGREGATED BELCHER & MIDES MINING COMPANY.—The *Chronicle* is officially authorized to state that the attorneys for the Sutro Tunnel mortgage holders received advices from New York on the 5th inst. to grant this company all they ask for. This settles any and all disputes about the title to that property.

NEW MEXICO.

GRANT COUNTY.

BREMEN MINING COMPANY.—Mr. M. W. Bremen, General Manager of this company, has adopted the

lease system, and has already made several contracts with miners. His lease provides that in case the men fail to make $3 per day, that they pay no royalty. The men working on day's pay are taking out good ore. Day and night shifts are working in one part of the mine. New ground is being opened up, and altogether the prospects are favorable. This company was floated in St. Louis about two years ago, but owing to financial difficulties had to suspend operations.

SAN PEDRO COMPANY.—An order was granted by Judge Lacombe in the United States Circuit Court at New York on the 13th inst., restraining George William Ballou, Leonard Lewissohn and the San Pedro Company from disposing of any of the property of the San Pedro Company. The order was granted on the application of George W. Morse, of Newton, Mass., a holder of 1500 shares of the preferred stock of the company, who has brought suit against Lewissohn, Ballou and the San Pedro Company for an accounting. He alleges that Ballou and his associates have fraudulently disposed of a controlling interest in the company to other corporations in which they are interested, and that further transactions of the sort are contemplated. Accompanying the complaint of Morse is an affidavit of John C. Lane, his counsel, that the defendants offered him 5000 shares of the Santa Fe Copper Company, a re-organization of the San Pedro Company, at 50 cents a share in return for "moral influence," to be exerted by him upon Morse and other stockholders. In our last issue we referred to the election of officers of the Santa Fe Copper Company.

NEW YORK.

ESSEX COUNTY

The Springfield Glue and Emery Wheel Company, of Springfield, Mass., recently bought a mine at Minerva, about eight miles from the Adirondack Railroad. The purchase covers 32 acres, and as the strip is bounded on one side by the public highway it is easily accessible. The rock produced is described as very hard, and when crushed each particle has very sharp edges, so that for cutting it is superior to ordinary sandpaper. As the mine is a large one it is regarded as an important find for the company and will largely increase its facilities.

OREGON.

Steps are being taken to establish a State mining bureau and geological survey in this State.

OREGON GOLD MINING COMPANY.—Further information relating to the suit to which we referred in our last issue shows that the stock is to be put into a trust, which will continue for one year from January 1st, 1889. This will include every share of capital stock, there being no treasury stock, the company providing all money needed for development, improvements, etc. The bond issue will be canceled.

PENNSYLVANIA.

COAL.

Work in the Sharp Mountain tunnel at Pottsville has been temporarily abandoned owing to the contractor throwing up the contract. He complains that he has lost money and cannot proceed with the work any further without incurring greater liabilities. The mountain has been pierced 150 yards. The full length of the tunnel when completed will be about 1100 yards. This work is being prosecuted by the Pardees, and it is understood that operations will shortly be resumed.

The court has granted the petition of the assignees in bankruptcy of the estate of Charles T. Yerkes, Jr., asking to complete the sale of coal land formerly owned by Mr. Yerkes. The property is a three-eighth part of what is known as the Red Mountain tract in Reilly township, Schuylkill County. It was put up for sale several times during the past twelve years, but as the bids were considered inadequate it was withdrawn. The present purchaser is Samuel H. Kaercher, of Pottsville, and the price paid is $27,000.

McClure & Co. are erecting 65 ovens near Tip Top. W. H. Gillitson & Co. are erecting 145 ovens. H. C Frick & Co. are erecting 600 ovens above Bradford.

CONNELLSVILLE COKE COMPANY.—This company has just finished 200 ovens at Leisenring and will erect that many more.

DUNBAR FURNACE COMPANY.—The coke property of this company at Dunbar was sold on the 14th inst. to the Cambria Iron Company. The plant consists of 80 ovens, with a capacity of 50,000 tons per year.

ELK HILL COAL AND IRON COMPANY.—This company has begun sinking a new shaft on the lands of P. Carter, in Scranton. The shaft is to be twelve by twenty-four feet in dimensions, and sunk a distance of 300 feet to the Clark vein. The breaker is to be erected on the site of the one formerly operated by this company in Dickson City. This will necessitate the erection of a mile of road, over which the coal will be transferred in cars by means of electric power.

SOUTHWEST COAL AND COKE COMPANY.—The company is clearing ground for the erection of 130 ovens at Moorewood.

STANTON.—Messrs. Lawrence & Brown, operators of the Lawrence colliery, at Mahanoy Plane, have secured a ten-year lease of this colliery, and will drive a tunnel across the basin a distance of 150 yards to reach the north and south dip veins to the back veins. Tunneling will commence about December 1st. Proposals will be received up to the 20th inst. The coal will be carried to the Lawrence colliery for market preparation. It is calculated by this move to displace 1,000,000 tons of coal that otherwise could not be available.

OIL.

Exports of refined, crude, and naphtha from the following ports, from January 1st to November 11th:

	1888. Gallons.	1887. Gallons.
From Boston	4,023,412	3,636,399
Philadelphia	116,181,303	144,564,838
Baltimore	6,516,165	6,897,741
Perth Amboy	18,916,641	14,462,129
New York	314,607,851	325,640,606
Total exports	464,245,372	495,201,713

The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of October, 1888, and during ten months ended October 31st, 1888, as compared with similar exports during the corresponding periods of the preceding year, as follows: October, 1888, $4,743,826; October, 1887, $4,183,665; ten months ended October 31st, 1888, $38,290,208; October 31st, 1887, $37,533,212. The exports from the above named ports comprise about 99 per cent of the total exports of mineral oils. It is stated on good authority that the distillation of 100 gallons of crude petroleum will yield 76 gallons of illuminating oil, 12 gallons of gasoline, benzine, or naphtha, 3 gallons of lubricating oil, and 9 gallons of residuum.

Mr. S. S. Hancock, who has charge of the oil drilling operations in Price Township, Monroe County, Pa., on 1400 acres of land leased by him, has succeeded in interesting the Board of Trade at that point in his enterprise, and they have decided to form a stock company and sink the well to a sufficient depth. The drill has reached a depth of 500 feet, and has produced an oily substance.

FORT PITT GAS COMPANY.—An oil well struck by this company, on the Phelps farm, Robinson Township, on the 13th inst., was doing twenty barrels a day. The well is only about five miles from the Pittsburg post-office, and about one and a half miles from the city line. It is stated that oil has never been found so close to Pittsburg before, and for that reason the well is creating considerable excitement. The Fort Pitt Company is controlled by Captain J. J. Buchanan.

UTAH.

The concluding arguments in the case of the Cleveland Mining and Milling Co. vs. The Dickert & Meyers Sulphur Co. were made before Judge Boreman, on the 10th inst., and the case taken under advisement.

BEAVER COUNTY.

FRISCO MINING AND SMELTING COMPANY.—All the right, title, claim and interest of this company, whose properties lie in Bradshaw and San Francisco Mining District, was to be sold on the 10th inst. by the United States Marshal.

MORGAN COUNTY.

NORWAY IRON MINING AND MILLING COMPANY.—This company, of Mill Creek mining district, recently resumed work again upon its mines, driving in upon the General Grant tunnel, where they soon expect to reach the main deposit of iron ore.

SALT LAKE COUNTY.

MACKAY & REVOLUTION SILVER MINING COMPANY.—This company's property, situated in the Little Cottonwood Mining District, will be sold by the United States Marshal for Utah on December 8th at 1 o'clock P.M., at the County Court House, in Salt Lake City. The properties consist of lands, mining claims (the same being incapable of advantageous sale in parts) and machinery, and will be sold by auction to the highest bidder.

NEW CHANCE MINING COMPANY (LIMITED).—This company, which is a reorganization of the Last Chance Mining Company, has just been furnished by the Utah & Montana Machinery Company with a complete crushing and concentrating mill with a capacity of 50 to 60 tons per day. This mill is located at the mouth of the British tunnel, where there is an abundance of water. This tunnel has been driven 2700 feet to tap the Last Chance lode at a depth of 1000 feet, where it intercepts the main shaft. This tunnel cost the company something over $40,000. Besides giving exit for ore and waste from the mine, it drains the property, besides a large space of country around, sending out a stream of fine, pure water. This property belongs to an English company, with George Cullen as local director and manager. A mining force has just been put in the mine on the tunnel or 1000-foot level to extract ore to supply the mill. The lode has been opened continuously on the Hooper, Last Chance Northerly Last Chance and Steamboat, a distance of nearly one mile. The ore runs from 30 to 100 ounces silver, 18 to 40 per cent lead and $5 to $20 in gold, the average being about $50 per ton in market value. It varies in width from 10 to 50 feet. The gangue consists of quartz, iron, both oxide and pyrites, spar and clay. Some ore has been shipped which was obtained by hand jigging, showing that it concentrates well. On the other claims on this lode nothing is being done, except that a few men are working on the Northerly Last Chance, where three men working on lease are taking out carbonate ore from the 250-foot level.

FOREIGN MINING NEWS.

MEXICO.

[From our Special Correspondent.]

SONORA.—The Sierra Blanca copper mines, near Imuris, are down, in one shaft, 200 feet, holding a good body of ore. On other mines of the property development is being done by means of drifts. The ore so far taken out has been shipped to Swansea, but it is the intention of the company to erect a smelter, so as to export bar copper only.

Placer mines have been discovered by Mexican prospectors about twenty-five miles southwest of Nogales. The specimens which were brought in, among which were some nuggets of fine gold weighing as high as 13 ounces, have caused considerable excitement, and several parties have started out from Nogales for the new diggings.

It is estimated that not less than 150 properties are now in course of development in this State, mostly by foreign capital.

The Trinidad mine is owned by the La Trinidad Mining Company, of London. Mr. John C. Schmidt, a mining engineer from the Comstock, is the general manager. The main vein on the property is said to be from 400 to 500 feet in width, and to average 25 to 30 ounces of silver per ton. The company paid $1,500,000 for the property, and has expended $500,000 more in development and in the erection of a large plant, which is calculated to treat 260 tons of ore in 24 hours. One-half of this vast plant has been completed, and is now running steadily with a net product of $50,000 per month.

In the Moctezuma District are the Lampazos silver mines, owned by Jackson, Smith & Co., who have expended nearly $100,000 in development. Their mines are said to have 30,000 tons of ore in sight, which is claimed to average 70 ounces of silver per ton.

In the Barranca District are situated the La Dura and several other mines owned by a German company. These mines are said to have produced over $3,000,000, and are claimed to have several millions still in sight. The ores average from 80 to 100 ounces per ton.

The Zubiate silver mine, 26 miles southeast of Hermosillo, is owned by D. Manuel Monteverde, who is said to draw a very handsome income from it. He is in treaty for its sale to an English company.

The Yeso and La Gloria silver mines, 36 miles northeast of Hermosillo, and owned by Messrs. Magruder & Fresh, turn out from $15,000 to $20,000 per month with a ten-stamp mill. It is expected to double this output very soon by increasing the plant. The ores of these mines yield from 25 to 30 ounces of silver per ton.

The San Geronimo silver mine produces from $8000 to $10,000 monthly, with a five-stamp mill. The vein is from 3 to 5 feet in width, and the ores are said to average over 60 ounces in silver per ton. The mine has been worked by Mexicans for over fifty years. It is now owned by J. H. McKim & Co.

The Año Nuevo and San Francisco mines are gold properties located in the Santa Barbara district, one hundred miles east of Hermosillo. They have been recently purchased by a St. Louis, Mo., company which has appropriated $60,000 to develop the mines and put up a stamp mill.

CHIHUAHUA.—A concession for working mines of every kind in the Barranca del Cobre District of San Andres del Rio, within a zone 30 kilometers long by 20 kilometers wide, has been granted to Mr. William Woodman Graham.

The Sabinal District, which has attracted considerable attention within a year or two past, is situated in the northern part of Chihuahua, about 80 miles west of San Jose station, on the Mexican Central Railroad, which is 100 miles from El Paso. The prevailing country-rocks of the district are porphyry and limestone, intersected by various silver-bearing veins that bear, in their relations to each other and to the limestone and porphyry contact, some distant resemblance to the ore-deposits of Leadville, Colo. The principal silver-bearing minerals are galena and carbonates of lead, with gangues of calcite, barite and quartz. The gangues are generally colored by, and very often considerably mixed with, the oxides of iron and manganese, rendering the output very desirable for the smelters. The lead ores contain on an average from 20 to 40 per cent of that metal, though perhaps the bulk of them will not run over 25 per cent. The silver in the lead ores varies between 15 and 60 ounces per ton, with sometimes a very fair show of gold. There are antimonial silver ores, that run in values from 140 to 600 ounces of silver.

There is also a group of mines that do not contain lead ores, but simply dry silver ores, and one or two gold claims.

This camp is still in its infancy, but I think it affords a fair field for intelligent investment, as wood, timber and water are abundant and some of the properties and prospects are very promising.

The Magdalena camp is newer than Sabinal. It is reached from the railroad switch of the same name 75 miles south of El Paso. The camp is 18 miles to west of this point over a good road.

The country-rock is said to be limestone, which is intersected by various fissure veins carrying galena and carbonates of lead, with a gangue of feldspar quartz and heavy spar.

The San Ignacio mine of this district is owned by Messrs. Neill & Co., of El Paso. The vein is from 6 to 15 feet wide, and carries ore which is said to be in the lowest drifts, a solid mass three feet wide of galena and carbonates, which assays in car-load lots from 40 to 45 per cent lead and 40 to 45 ounces of silver per ton. Work in this mine is going on regularly, and shipments of ore are made weekly to El Paso. The main shaft is down 160 feet, with several levels at various depths.

There are numerous other partially opened properties and prospects in this camp, which, if properly looked after, might develop into an important shipping district.

The Barranca del Cobre district is located about 175 miles west of the city of Chihuahua, on the wild and rugged eastern slope of the Sierra Madre. The principal mines are those of the Purissima group, now being worked by an English syndicate. The formation

is said to be porphyritic, and the ores are sulphurets of copper, averaging 17 per cent of that metal, with some 5 ounces of silver, 1⅛ ounces of gold, per ton. The gangue is quartz and feldspar. It is said that from 1500 to 2000 tons of ore are now on the dump, and that 200,000 tons more are blocked off and in sight in the mine, which has seven adit levels which communicate with a ventilating shaft. There have been 3700 feet of drifts run upon the property, and a 20-stamp mill is now erecting. Just why the company should put up a stamp mill to treat ore containing 17 per cent of copper is not very clear.

COAHUILA.—Wonderful new discoveries of ore-deposits are reported from the vicinity of Sierra Mojada. Although the latter mining camp has been known as a large producer for some years the desert country around it has as yet been imperfectly explored, and there is no reason to doubt that discoveries may be made there as rich as any heretofore known. The great drawback to the prospector and miner in this region will always be the scarcity of water, which has been severely felt in the Sierra Mojada itself and is now only partially remedied.

From the Fronteriza mine, in the Sierra del Carmen district, I hear most conflicting reports. One report affirms that a very rich vein assaying 2000 ounces per ton has been struck, and that $175,000 worth of ore is now on the dump awaiting the completion of a forty-stamp mill that will commence work about Christmas. Another party says that only fifty men are at work spasmodically in the whole district, and that mining there is, at present, at a practical standstill.

At the Cedral mines in Santa Rosa de Muzquiz about sixty men are working to develop the coal deposit which is part of the property, and the product from which is to be used on a larger scale than heretofore for the smelting of the extensive silver lead deposits on which the mine was first opened. Much money has been sunk unprofitably at Cedral within the past ten years through bad management, and it is to be hoped that the present owners will act more judiciously, as the property itself appears to be worthy of a better fate.

At the San Juan mine, in Santa Rosa, a new shaft is being sunk, the old one having been abandoned as too expensive for retimbering and clearing out.

At the San Pablo mines, near Cuatro Cienegas, the Philadelphia owners are still at work developing the property.

Some effort is being made to work the iron deposits known to exist in the Sierra del Carmen district. The chief obstacle to this is the distance of these deposits from the railroad, at least one hundred miles, but a narrow gauge road is talked of, and a party of surveyors reported to be making the preliminary survey.

The coal companies at San Felipe are putting on more force. Sixty miners from Zacatecas arrived at the mines a few days ago and more are coming. It is intended to raise the output of the mines to 1000 tons a day.

The Ojo Caliente silver-lead mines near Saltillo are being quietly developed by their owner, U. S. Consul John Woessner, of Saltillo. He has made several shipments of ore which have given encouraging results.

NUEVO LEON.—The properties at the Yguana camp, near Lampazos, now in the hands of Fort Scott, Kansas, capitalists, are reported as showing up very satisfactorily. The Santo Domingo mine in the Mitra mountain near Monterey, has uncovered a body of lead carbonates with a good streak of argentiferous galena. It is owned by parties in Laredo, Texas.

The buyers now operating in the State are as follows: The Mexican Ore Company, which has sampling works in Laredo; the St. Louis & Zacatecas Ore Company, with sampling works at Monterey; the Guadelupe Mining and Smelting Company, with works at Laredo and Villaldama; J. F. Mathews & Co., representing the Omaha & Grant Smelting Company, of Denver, with sampling works at Villaldama. All of these parties have lively agents who will climb any mountain to get a chance at a few tons of ore, and will pay for the same f.o.b. at any station on the Mexican National Railroad.

The Rosario mine, at Salinas, leased by J. F. Mathews & Co., is reported to be turning out twenty tons of ore a day.

Mr. Ernest Bogusch has been appointed superintendent of the Vallecillo mines, which were in charge of his brother, the late R. F. Bogusch, whose death by accident we recently recorded.

DURANGO.—Reports from the "La Misma" mine near Ventanas are very encouraging. A recent shipment of 35 tons of ore was made, which gave net returns of $93 in gold and silver per ton. Sixty tons of ore were taken out in sinking a shaft to the depth of 90 feet, and all was of good grade, although not quite equal to the above. The mine is owned by St. Louis and Chicago parties.

OAXACA.—Messrs. Carlos Eisenmann and Ignacio Alfaro have bought a group of mines called Jayacastepec from Gen. Meiscuero, ex-governor of the State. The vein of silver ore on this property is asserted to be the widest known. It is supposed that the completion of the Tehuantepec Inter-oceanic railroad (not the ship railway), which has been lately contracted for by the Mexican government, will greatly enhance the value of the property.

MICHOACAN.—It is said that the Ministry of Public Works is about to send a commission of engineers to this state in order to study its agricultural and mineral resources.

ZACATECAS.—A New York company, of which Mr. G. A. Liliendahl is representative, has decided to erect a stamp-mill at Fresnillo. They have recently purchased some silver mines near the above town and some copper mines near Ventura. A smelter is to be erected at the latter place.

HIDALGO.—I am informed by a correspondent in Pachuca that the new cross-cut in the Cueva Santa mine has cut the vein and found it with a wide and rich paystreak, and that continued exploration along a seam of ore uncovered some time ago has disclosed a body of ore some 8 feet wide, samples of which have given an assay of 200 ounces per ton.

In the San Ignacio mine one of two boilers that belonged to the steam hoist exploded on the 27th of last month, killing seven men and horribly injuring twenty-seven others. This result is said to be due to the machinery having been left in the hands of an ignorant native who had a cheerful habit of loading the safety-valve with bricks so as to lessen the labor of keeping up steam.

As I reported some time ago, Srs. Trinidad Garcia and Andres Almoraz have been granted a patent for a process for the metallurgical treatment of ores of gold and silver, in which they dispense with the use of salt and of sulphate of copper. They claim that the reactions hitherto supposed to take place during amalgamation on the patio or in pans are utterly false, and that the work is really done by currents of electricity generated within the mass submitted to amalgamation. They claim that the salt is only useful in the process as a conductor of electricity, and not as a reagent, hence they replace it by another substance, which is as yet kept secret, which is a better conductor and much cheaper. The sulphate of copper is said to play the part of the copper plates in an ordinary battery, hence they substitute another substance having the same effect, and cheaper, for the sulphate.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 16.

Statistics.

Production of Anthracite Coal for week ended November 10th and year from January 1st:

	1888.		1887.
Tons of 2240 lbs.	Week.	Year.	Year.
P. & Read. R.R. Co.	198,570	6,168,520	6,449,290
Cent. R.R. of N. J.	142,007	4,951,043	4,294,630
L. V. R.R. Co.	160,772	5,840,215	5,277,491
D., L. & W. RR. Co.	156,696	6,031,081	5,072,605
D. & H. Canal Co.	99,042	3,869,065	3,369,162
Penna. R.R.	71,850	3,848,706	3,196,398
Penna Coal Co.	36,339	1,468,336	1,349,838
N. Y., L. E. & W.	25,000	845,551	657,935
Total	890,276	33,022,517	29,527,349
Increase		3,495,168	

The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period:

1883	28,060,808	1885	26,821,019
1884	26,914,936	1886	27,958,000

Production of Bituminous Coal for week ended November 10th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1888.		1887.
Tons of 2240 lbs.	Week.	Year.	Year.
Phila. & Erie R.R.	691	55,905	16,85
Cumberland, Md.	79,584	3,110,281	2,792,522
Barclay, Pa.	2,500	141,729	157,141
Broad Top, Pa.	9,306	311,473	294,917
Clearfield, Pa.	65,614	2,879,751	2,729,761
Alleghany, Pa.	17,251	679,446	721,849
Pocahontas Flat Top.	27,662	1,183,295	870,391
Kanawha, W. Va.	28,836	1,388,172	1,216,376
Total	231,444	9,750,052	8,799,811

WESTERN SHIPMENTS.

Pittsburg, Pa.	17,437	629,760	482,173
Westmoreland, Pa.	31,425	1,329,712	1,222,960
Monongahela, Pa.	8,765	346,347	327,317
Total	57,627	2,305,819	2,032,450
Grand total	289,071	12,055,871	10,832,262

Production of Coke on line of Pennsylvania R.R. for week ending November 10th and year from January 1st, in tons of 2000 lbs.: Week, 91,954 tons; year, 3,455,294 tons; to corresponding date in 1887, 3,123,616 tons.

Anthracite.

For some time past the ENGINEERING AND MINING JOURNAL has foreshadowed the course which the anthracite trade was likely to take, and it has followed it to the letter.

The enormous production of coal during the year up to the commencement of the present month, indicated not only a large consumption of coal, but an abnormal one. Many places which were bare of coal have stocked up, and have thus absorbed a large part of the production which has been credited, perhaps, to consumption. The stocks are now pretty well completed, and the consumptive demand is showing itself to be lighter than during the past few months, while production continues almost at its maximum. The consequence is a general weakness in the market, not in the prices which the companies ask, but more in the urgency with which individual operators are seeking to place their coal. It is not only easy to buy coal, but it is becoming a little difficult to sell it. Stove coal continues in good demand, and there is a market for all that can be brought down, but all the other sizes, and especially broken and pea coal, are extremely dull and hard to sell.

Individual shippers have shaded nearly all the sizes, and will no doubt continue to do so during the balance of the year.

At the meeting of the sales agents this week prices were discussed, and it was recognized that the market had passed its apex and was likely to become weaker as the season went on. Nevertheless, the lesson which the ENGINEERING AND MINING JOURNAL has been inculcating, that the reserves of anthracite are much smaller than generally supposed, and that the supply will not last very far into the future; that the maximum production of the mines will be reached in a very few years, and that thereafter the market will take all, and call for more than all the coal that can be shipped; has been taken to heart, and the opinion was quite general that the prices should be maintained where they are, and if the market would not take the coal at these figures, then production should be curtailed to that point where the market would absorb it at the present current rates. This, we need not say, is a healthy frame of mind for the managers of the coal trade to be in, and if they maintain it there is no reason why the present prices should not be maintained the year through.

Let each producer curtail output to a point where it will only supply what the market calls for. The "business is not lost," as one of the gentlemen remarked, "it is only deferred," and if this policy be adopted by each of the producers, whether as independent operators or as a "sympathetic union," the market will certainly remain in a satisfactory condition. If, however, the old policy, with which we are all familiar, should be again resorted to, in which each company is quite ready to decree that his neighbor, but not himself, shall stop, then we will see the old story acted over again. We do not, however, anticipate anything of this sort at the present moment. Prices remain nominally as we have been quoting them, but with a good deal of cutting by individual operators, as is usual in a dull market at any season of the year.

We quote f.o.b. prices for free burning coal at New York shipping ports nominally as follows: Broken, $3.95; Egg, $4.30; Stove, $4.65; Chestnut, $4.65; Pea, $2@$2.25.

The suit which Coxe Brothers & Co. have brought against the Lehigh Valley Railroad has brought out an answer from the defendants, and they deny nearly every thing that is stated in the complaint, but admit that they carry bituminous coal for but little more than half the price of anthracite per ton mile, and they make the extraordinary statement that it costs more to load and unload anthracite coal than it does bituminous. They plead also that it has been the custom to charge more for bituminous coal than for anthracite on the railroads, and thus appear to defend an abuse which they cannot deny. We are still of the opinion that the Interstate Commerce Commission will support the view of the plaintiffs, and that the cost of transporting anthracite coal will be regulated in the future by that of transporting bituminous coal. The question is a very important one, and we are glad that a firm so strong financially and so upright morally should have taken the matter in hand and sought a solution of the problem. Whatever decision is obtained will be for the benefit of all, and there will be no compromising with Coxe Brothers & Co.

Bituminous.

The bituminous trade is quiet but active, and prices are firm and well maintained. It is in better condition than the anthracite trade. At the present moment we hear of little that is worthy of note in this market.

The Richmond Basin, which has afforded so many great expectations and so many sad disappointments, is to be again tested by a company which has its headquarters in Boston.

The natural coke, so-called, is being mined, and it is said that the mine is looking very well, and that the coal is giving great satisfaction. It ranks in the market with Lykens Valley anthracite and commands the same prices. It certainly makes a very excellent grate fuel. We continue our prices of bituminous coal as heretofore: $2.60 f.o.b. Baltimore and Georgetown, and $3.25 for New York Harbor.

Boston. Nov. 15.

[From our Special Correspondent.]

The freight situation continues to be the leading factor in the coal market as viewed from this port. Rates are way up and their strength and advancing tendency has had a depressing effect upon trade. The average coal dealer will not yet knuckle under to the idea that these high rates have come to stay. They argue now, as for some weeks past, that when the vessels are better distributed rates will go down. Considerable coal is coming forward, but it is largely on old orders. It is something of a surprise that the wholesale market remains as firm as it does, even when trade on new orders is so dull. It is the belief held by many that considerable restriction is quietly going on. A howl would be raised at once by the public (now so scared about trusts and combines) if restriction were openly advocated. Were it not for reduced output, however, the stock of broken and egg would be more burdensome now than it is. There is an abundance of both sizes, but f.o.b. prices are not being cut very badly. Stove coal seems to be in better supply and detention on this size is now slight. Some individual operators are cutting full circular rates on stove.

Shipments of bituminous coal are being crowded along and the shippers are held to be mainly responsible for the high freights. It is they who are chiefly paying them at any rate. F. o. b. rates remain unchanged at $2.45@$2.60.

It will depend a good deal upon the weather how freights will run in the near future. At present rates are about as high as ever, but they vary from day to day so that it is very difficult to quote without employing a wider range than usual. If the weather continues mild, it is expected that rates will go off somewhat, but a cold spell would be apt to cause an even

greater advance if there were the customary rush to ship before the close of navigation.

We quote vessel rates, exclusive of discharging: New York, $1.20@$1.30; Philadelphia, $1.55@$1.65; Baltimore, $1.55@$1.60; Newport News and Norfolk, $1.55@$1.60; Richmond, $1.75; Provincial, $1.90@$2.

There is nothing worthy of note doing in a retail way. The mild weather is a drawback.

Delivered prices are: Stove and Nut, $6.50; Egg, $6.25; Broken, $6; Franklin, all sizes, $7.75; Lehigh Egg, $6.50; Broken, $6.25. Wharf prices 50 cents less than the above. Bituminous coal, $4.25 on the wharf.

Buffalo. Nov. 15.

[From our Special Correspondent.]

No news this week. Prices without variation. The features of the market alluded to last week are unchanged. Good demand for lake tonnage to Chicago; light inquiry for Milwaukee and Duluth, occasionally a charter to other points. A few vessels to Chicago taken to arrive.

Severe storm from Friday P.M. to Sunday A.M. Many disasters on lakes.

The shipments by lake westward from this port from November 8th to 14th, both days inclusive, were 85,560 net tons, namely, 44,950 to Chicago, 18,850 to Milwaukee, 9900 to Duluth, 3000 to Toledo, 4300 to Superior, 600 to Saginaw, 850 to Pt. Huron, 150 to Dunville, 750 to Green Bay, 260 to Dover, and 2100 to Glad-tone. The total shipments thus far this season 2,404,870 net tons, including cargoes on vessels from Tonawanda not reported at Buffalo Custom House.

The ruling freight rates on coal were 100c. to Chicago, 110c. to Racine, 90c. to Milwaukee, 70c. to Saginaw, 60c. to Gladstone, and 50c. to Duluth, Superior, Port Huron, Detroit and Toledo.

Receipts of coal here by canal first week in November, 4753 net tons; shipments, none.

Pittsburg. Nov. 15.

[From our special correspondent.]

Coal.—The market remains dull, prices weak, without change in values. The miners are still at work. Price of mining, 1st and 2d pools, 3 cents; 3d and 4th pools, 2¾ cents. The rise we promised came to hand with Ohio River shipments exceeding 4,000,000 bushels. The lower markets are overstocked and coal is a drug, often selling below cost of production. How long this condition of affairs will continue is for the future to determine. Later.—A meeting of coal operators, dealers and shippers has been called for Monday next to discuss the advisability of closing all the coal mines in the Pittsburg district, the output of which is sent South. This move is attributed to the heavy stocks of coal in Southern ports. The shut-down would affect 3000 to 5000 men.

Prices in the pools are.

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

First pool	$4.75	Fourth pool	$3.25
Second pool	4.25	Railroad coal	5.00
Third pool	3.75		

Connellsville Coke.—The demand continues active. The advance previously noted has been maintained; trade steadily increasing. The car supply is better than last week. The October shipments exceed 27,000 cars (about 500,000 tons). Week's shipments aggregate 6200 cars. The estimated increase for the week was 1500 tons. Already a movement is on foot for a further advance. Many think $150 coke is not far off.

The new rates are: Blast-Furnace, $1.25 per ton; to dealers, $1.35; foundries, $1.40; crushed, $2.20.

Freight rates to Pittsburg, 70c. per ton: to the Mahanoy and Shenango valleys, $1.35; East St. Louis, $3.20; to Cleveland, $2.80; to Chicago, $2.75; to all other points the same proportions.

Latest.—Pittsburg coal men have about decided to close down the Monongahela and Youghiogheny mines until the first of February. With coal selling in Cincinnati 5¼@6c., it does not cover first cost, leaving out the losses. The outlook for the coal trade is very bad.

FREIGHTS.

The latest charters to November 16th per ton of 2240 lbs.

From New York to:—Bath, 1.30@1.40*; Beverly, 1.15@1.20*; Boston, 1.10@1.15*; Bridgeport, Conn., .60; Cambridge, Mass., 1.15*3c.; Cambridgeport, 1.15*3c.; Charlestown, 1.15*; Chelsea, 1.15*; Com. Pt., Mass., 1.15*; E. Cambridge, 1.15*3c.; Fall River, .75@.90; New Bedford, .80@.90; Newburyport, 1.25*; New Haven, .60; Newport, .85@.90; New London, .85; Newport, .75@.85; Norwalk, Conn., .60@65; Norwich, .90; Portland, 1.10*; Portsmouth, N. H., 1.20*; Providence, .75@.85; Salem, 1.20*.

From Philadelphia to:—Bangor, 2.00*; Boston, 1.55@1.65*; Charleston, .90; Com. Point, Mass., 1.42½*; East Cambridge, 1.50*; Fall River, 1.15@1.25*; Galveston, 2.90*; Gardner, Me., 1.60*‡; Georgetown, D. C.,*.85; Lynn, 1.75@1.85*; New Bedford, 1.15@1.25*; Newburyport, 1.75*; New York, .90†; Norfolk, .70; Portland, 1.50@1.60*; Portsmouth, N. H., 1.60*; Portsmouth, Va., .65; Providence, 1.15@1.25*; Richmond, Va., .75; Rockport, 1.22½*; Saco, Me., 1.75*; Salem, Mass., .90*; Savannah, 1.00; Washington, .85; Weymouth, 1.15*; Wilmington, N. C., .60.

From Baltimore to:—Bangor, Me., 1.60; Bath, 1.60; Boston, 1.55@1.60; Bridgeport, Conn., 1.35@1.40; Bristol, 1.25@1.30; Brooklyn, 1.15@1.20; Charleston, 1.15; Fall River, 1.45; Galveston, 3.00@3.25; Gardner, Me., 1.75; New Bedford, 1.35@1.40; Newburyport, 1.55; New Haven, 1.35; New London, 1.35; New York, 1.25; Portland, 1.55@1.60; Portsmouth, N. H., 1.60@1.70; Providence, 1.45; Quincy Point, 1.50; Richmond, Va., .80; Roxbury, 1.50 3c.*; Salem, Mass., 1.55@1.60; Savannah, 1.15; Somerset, 1.35; Williamsburgh, N. Y., 1.15@1.25; Wilmington, 1.00.

* And discharging. 3c. per bridge extra. † Alongside. ‡ And towing.

METAL MARKETS.

NEW YORK, Friday Evening, Nov. 16.

Prices of silver per ounce troy.

Nov	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Nov	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.
10	4.87⅛	43 1-16	94	14	4.87⅛	43	93⅞
12	4.87½	43	93⅛	15	4.87⅛	43	93⅞
13	4.87½	43	93⅞	16	4.87½	43	93⅞

Silver market quiet, tendency uncertain.
Exchange market firm.

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in its rate for discount, and it remains at 5 per cent. During the week the bank lost £46,000 bullion, and the proportion of its reserve to its liabilities was raised from 36.52 to 38.40 per cent against an advance from 47.11 to 47.72 per cent in the same week of last year, when its rate for discount was 4 per cent. Thursday the bank lost £687,000 bullion on balance. The weekly statement of the Bank of France shows a loss of 1,875,000 francs gold and a loss of 275,000 francs silver.

Copper.—We have no alteration to report in the general position. During the week a few lots of Lake copper have been sold at 17⅛, but beyond the sales direct to consumers by the syndicate, other transactions are few and far between. Casting copper still continues in good demand at 16⅛@16¼. Mail advices from England report more inquiry for yellow metal and copper sheets, with a stiffer tendency in prices. The following are present quotations: Tough, £80 to £80 10s. Best Selected, £81 10s. to £82. Strong sheets, £86. India sheets, £85. Some large transactions have taken place in G. M. B., and the market closes firm at £78 12s. 6d. Chili bars are steady at £78 15s. spot and £79 5s. 3 months. The "Statistics of Copper," as compiled by Messrs. Henry R. Merton & Co., of London, show the stocks on October 31st last to be 93,988 tons, against 90,754 tons on September 30th, and 48,503 tons on October 31st, 1887. To the reported stocks must be added the copper at the mines in Spain and at the Anaconda, and at other points in this country which are not reported.

Tin.—During the greater part of the week this market has been somewhat depressed, and some parcels have changed hands at low prices for sharp cash, as little as 22⅜ having been accepted. In "futures" a good deal of business was done, and about 200 tons changed hands for January and February from 22⅛ down to 22·30. It is supposed that these sales were principally on account of "bears," but everything offered was readily taken up by strong buyers, and to-day the market is much firmer, and the "bears" of yesterday are trying to cover at higher prices.

The market closes firm at the following quotations: Spot, 22⅛; November, 22⅛; December, 22·60; January, 22·50; February, 22·50. The London market was to some extent affected by the flatness here; but the decline there did not correspond with the fall on this side. Tin sold there down to £100 5s., but latest cables report a large business and firm close at £100 10s. spot, and £101 7s. 6d. 3 months. At present prices it does not now pay to import tin from London into this market.

Lead.—A good regular business has been done during the week, and from ten to twelve hundred tons have been taken by consumers, whilst speculation seems to have entirely ceased for the time being. Quotations are well sustained, and although some sales have been made at 3·70, the market closes steady at 3 75@3·80, but sales have been made below this price. One hundred tons, on dock, is reported sold at 3·65.

Owing to the "attachments" of some banking firms, large quantities of lead are still locked up. The attachments in question are on lead stored in public warehouses, and for which the usual negotiable receipts have been issued by the warehouse proprietors. It is alleged that the parties taking these proceedings claim that the lead referred to was obtained by fraud; but as the storage receipts were passing from hand to hand long before the failure of the firm said to be compromised, if this action on the part of the banking house prove successful as against the present innocent holders of the receipts, it would strike a severe blow to all kinds of business, and completely destroy the confidence always felt that the holder of such receipts was the undoubted owner of the goods covered by them. It is, obviously, impossible for holders of these receipts to become acquainted with every transaction connected with the stored goods previous to same coming into their possession, and if this is held to be necessary the bankers themselves would hardly be likely to make advances on these warehouse receipts. The foreign lead markets have been steady all along, and large quantities have also been purchased in those markets by consumers at present reduced quotations. An order for 10,000 tons of lead piping for Buenos Ayres, to be delivered over the next 24 months, has recently been placed in the London market. Spanish lead, £13 5s.; English lead, £13 12s. 6d.

Chicago, Ill.—Messrs. Everett & Post telegraph us to-day: Market has ruled quiet, with transactions of about 600 tons at 3·55@3·60. Market closed quiet; 3·50 asked for Common.

Spelter has been rather neglected, and only small transactions have taken place at 5·07½ to 5·12½. Foreign spelter is scarce at 6 to 6⅛. In London the quotations are £18 17s. 6d. to £19 for ordinary, and £19 to £19 2s. 6d. for specials.

Antimony is higher again, and the English makers being well sold, Hallett's is now quoted in London £44 for December shipment, and Cookson's £47. Quotations here are still somewhat below the cost of importing, but there is very little of the metal obtainable. We quoted Hallett's, 10⅝@10¾c.; Cookson's, 13c.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 16.

Heavy Chemicals.—The general tone of this market continues firm, but we are unable to record any material increase in the volume of business. Consumers seem disinclined to enter the market for anything more than hand to mouth supplies, and as a consequence there is a disposition among sellers to shade previous prices a little when it is necessary to obtain business. This, however, seems to be simply an incidental condition of the local trade, as the general tenor of foreign advices is to the effect that values are firmly maintained, and that the outlook for the coming year is exceptionally good. Messrs. S. W. Royce & Co., of Manchester, report under date of the 2d inst., that "good business continues to be done in bleaching powder, caustic soda and soda ash. Sulphate of ammonia has again advanced under further improved inquiry from the continent. The improvement in crude and crystal carbolic is maintained. Lead salts have again become firm, after the fall in lead." Messrs. J. P. Brunner write from Liverpool, on the 3d inst., as follows:

"A firm market for chemicals, with the exception of caustic soda, is to be reported, but the principal inquiries are for forward deliveries. Soda ash is scarce for prompt delivery, and sellers hold for full prices. For all 1889 makers are very strong in their ideas, owing to the advanced prices demanded for salt and fuel. For contracts over next year, there is nothing to be had less than 10s. per ton advance on prices paid for 1888 contracts. Soda crystals are in improved request and now held for £2 10s@£2 12s 6d. Caustic soda, owing to scarcity of orders and anxiety on the part of resellers to press sales, is weak for prompt delivery, and nearest values are: 60 per cent, £6 7s. 6d@£6 10s.; 70 per cent, £7 7s. 6d.@£7 10; 74 per cent, £8@£8 2s. 6d.; 76 per cent. £8 17s. 6d.@£9. For some special brands an advance on the higher figures is asked. For 1889 delivery there is a fair inquiry, and makers ask £7 10s. @£7 15s. for 70 per cent, while resellers might possibly be found at 2s. 6d. under the lower figure. A number of makers still decline to quote for forward delivery until they know what price the syndicate are going to charge them for their salt. Bleaching powder is strong at £8@£8 2s. 6d., and a fair business has been done for early delivery at the lower figure. There are a number of inquiries for delivery over 1889, and one maker is reported to have sold out at over £8, it is said. We should call £7 15s.@£8 nearest values for 1889 contracts, but doubt if sellers could now be found at the lower figure. The annual trade meeting of the bleach makers was held here on the 1st inst. and the combination confirmed for all 1889. As usual a very unanimous and satisfactory meeting was reported. It is stated the committee have been asked to draw up a scheme for placing the decomposition of salt on a new basis, which scheme is to be submitted to the trade at a future meeting. Chlorate of potash is quiet at 5⅝d. to 6d. on the spot, and 6⅛d. to 6¼d. for all next year. Bicarbonate of soda is firm at £4 10s. to £4 15s., according to brand and quantity."

Liverpool brands of carbonated soda ash are rather dull. Inquiries are few and there is little actual business reported except in a small way for pressing requirements. The strength of the Liverpool market, however, sustains prices here, and quotations remain at 1·25@1·27½c. to arrive and 1·27½@1·32½c. on the spot.

Newcastle soda ash, 48 per cent, continues about as previously quoted; any advantage which sellers might obtain because of the limited stock on the spot is offset by the limited demand. We continue to quote 1·22½@1·27½c. to arrive, while spot is held at 1·25 @1·27½c, according to quantity.

Caustic soda ash, 48 per cent, is slightly weaker in price, owing to the lack of any important demand. The market may be quoted about 1·27½@1·30c. for both spot and arrivals.

Caustic soda is again weaker. The absence of any important inquiry, coupled with weaker Liverpool advices, leaves nothing to keep up prices, and dealers are therefore obliged to shade the prices of a week ago. The usual quotations for 60 per cent are 2·55@2·60c., and about 2·35c. for the higher tests, 70@74@76 per cent.

Sal soda is held rather firmly, although the past week has developed no important demand. Spot supplies are limited, however, and holders seem to be firm in their views. Arrivals are quoted at ·95c., while spot may be had at ·95c.@1c.

Bleaching Powder.—Although transactions at present are small and the demand light, the Liverpool reports tend to raise the hopes of holders and to create the impression that higher prices are in store for the year 1889. For supplies on the spot 2·12½@2·15c. is asked, while to arrive is quoted at 2@2·06¼c.

Kali Industry.—The total daily output of the different works of potassic salts, according to the syndical contracts, amounts to an accepted average of 50,000 ctrs. carnallite, and 8000 ctrs. various sulphates for manufacturing purposes (viz., 5200 ctrs. kainit and 2800 ctrs. schönit) together with 15,000 ctrs. kainit

for agricultural purposes; these consist of: Prussian fisc, 13,452 ctrs.; Anhalt fisc, 13,452 ctrs.; Schmidtmannshall, 12,785 ctrs.; Neustassfurt, 11,785 ctrs.; Westeregeln, 10,316 ctrs.; Vienenberg, 5808 ctrs.; Ludwig II., 5400 ctrs. In order to meet the orders on hand the daily output of carnallite has been increased to 60,000 ctrs. dating from October 1st.—*Kühlow's.*

Acids.—Considerable business is reported in most lines, and prices continue at about previous quotations.

Acetic Acid.—The market for this article is undoubtedly weak, for reasons pointed out in former reports, and although in some quarters there are vain attempts to keep prices at a profitable figure, there are many manufacturers who will shade their quotations considerably for contract. Small quantities are held at 2@2¼c., while the nominal contract price for large orders is 1·80@1·87½c.

Nitric acid is held rather firmly. The increasing price of nitrate of soda will, of course, greatly increase the cost of production. Prices remain as follows: 36°, 4@5c.; 38°, 5@5½c.; 40°, 6c.

Muriatic acid is only in moderate demand. Quotations are about as follows: 18°, 1·20c.; 20°, 1·30@1·50c.; 22°, 1·40@1·80c.

Oxalic Acid.—The trade presents no new features other than those here noted last week. While transactions are light, prices are well maintained at 8½c. per lb. for large lots, and 9c. per lb. by the single cask.

Tartaric acid is quiet and unchanged. Previous quotations rule.

Sulphuric acid continues firm; manufacturers are crowded with orders, and in some instances are said to be unable to fulfill existing contracts. Fair quotations for 60° are 90@95c., while 66° is held at 95@1·25c., according to quantity and seller, with little obtainable at the former figure.

Fertilizers, etc.—There is little actual change in the position of these articles, available supplies in many instances being light, and prices in consequence firm. There is a good demand, and transactions have been large. The revised price list is as follows: Azotine, $2.55@$2.60 as to quality; dried blood (city), low grade, $2.50@$2.55 per unit; Western high grade, $2.60@$2.65 per unit for ground material; tankage, high grade, $24@$25 per ton; low grade, $22@$23 per ton, as to quality. Fish scrap, $24@$25 per ton f.o.b. factory. Sulphate of ammonia, $3.40 per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate, is quoted at $19.00@$19.50 per ton. Dissolved bone-black is 97½c.@$1 per unit for available phosphoric acid, and acid phosphate 75@80c. per unit for available phosphoric acid.

Steamed bones, unground, $19; ground, $25@$26.

Charleston rock, undried, $5@$5.25 per ton; kiln dried, $6 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, is held at $10@$10.50 ex steamer at New York.

Muriate of potash continues scarce on the spot, and prices firm accordingly. Both spot and arrivals are held at $1.80@$1.85.

Double Manure Salt. Freights continue high and scarce, and supplies are, therefore, very limited. Prices remain at 1·15@1·20c. on a basis of 48 per cent potash. High grade sulphate of potash is unchanged at $2.30 per cwt., on a basis of 90 per cent.

Kainit.—The situation is essentially unchanged—nothing in store, freights high and scarce, and prices very firm. There is no change in quotations, which remain nominally at $9.75@$10 per ton for nearby cargoes, and $9.50@$9.60 for shipment, foreign invoice weight.

Brimstone is easier owing to recent arrivals, which have satisfied the existing demand. Best unmixed seconds on the spot are now quoted at $22, while to arrive may be had at $21.

Nitrate of soda is again advanced in price, although there is some 50,000 to 55,000 bags on the spot. Arrivals are quoted at 2·25@2·27½, and spot, 2·30c. Along with this advance comes the cheering intelligence from a dealer "in the arrangement" that "prices will go higher." According to the statistics compiled by F. B. Nichols, of this city, the visible supply on the 1st inst. was 274,671 bags, against 264,644 bags at the same time in 1887, while the total deliveries in United States for consumption to November 1st amounted to 384,460 bags, against 427,053 bags last year. Messrs. T. F. Edmunds & Co., Boston, estimate the visible supply from November 1st, 1888, to February 1st, 1889, at 212,600 bags and state that the deliveries for consumption during this period last year were 90,741 bags. F. B. Nichols also reports: "The demand from store was moderate. Consumers receiving ex ship and many awaiting arrival of over due cargoes. The market continues firm and tending upward. Europe has again advanced on moderate shipments from the coast and a probable increase of consumption. Valparaiso remains strong with transactions at 2·22½c. for spring delivery."

Minerals.—Sulphate of barytes has been sold in a jobbing way at previous quotations, with the trading generally devoid of interesting features. The quotations remain at $21.50 for special brands of imported; best No. 1, $17.50@$18.50; best off colored grades, $15.

China Clay.—There have been several arrivals which have enabled dealers to fulfill old contracts, and this has given a degree of activity to the market, but there is otherwise nothing of interest to report. Very few new sales are reported, and prices remain at $13.50@$18, according to grade.

Chalk.—There is very little offering, and prices, although nominal, are firm at about $3.75.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Nov. 16.

The week on the Building Material Exchange has been quiet, with transactions of very fair proportions for this season of the year, and with prices ruling firm. Considerable building is still going on, thus producing a very fair degree of activity in the market for materials. The proposed scheme for the consolidation of the Building Material and the Mechanics and Traders' Exchanges will shortly be placed before the members of the former exchange through a circular now being prepared by the President.

Bricks.—Supplies come to hand rather irregularly, but there is still an over-supply of some of the better qualities. Prices, however, are firm, and there is a gradual advance as the season progresses and less stock is brought on the market. Hudson River work is practically ended, and although there is some of the New Jersey product coming forward, the quantity is not large enough to affect this market to any great extent. Pales continue in about the same condition as previously reported, there being still a plentiful supply against an indifferent demand. The medium qualities are well sold up.

Lime.—The market just at present is bare, as all arrivals from the East have been pretty well cleaned out; but on the whole the supply keeps well up to the existing demand. Values are well sustained, and a fair steady sale is reported.

Cement.—Rosendale cement is in very good demand, dealers are hurrying up their orders for the trade throughout the State, while the shipping season is open, and there is a considerable local demand, which takes about all that is offered. Prices are therefore firm. Although agents for special brands of Portland claim that a ready outlet is found, it is apparent that the heavy importations have been rather more than the market could take.

For prices of building materials and wages paid to laborers in New York and vicinity see our register of Current Prices on another page.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 16, 1888.

American Pig.—This market is very quiet and featureless. There are no large orders coming in, and the demand from manufacturers is rather lighter than is usual at this season of the year. Prices remain unchanged at from $18@$19 a ton, though it is said that some Southern iron has been sold at $17.50 for No. 1 for next year's delivery. It is now almost certain that contracts will be made for next year's delivery at the present prices. There will be no advance in prices of pig-iron here; at least that seems to be the general impression in the trade and among some of the large makers.

The prices of production are being reduced even in the face of a slight increase in the cost of coke and ore. An instance in point may be cited in the case of the Thomas Iron Company, which some months ago inaugurated the method of buying ores on the unit of iron contained in them, where formerly the ore was bought at so much a ton without regard to its percentage of iron. The immediate effect has been to greatly improve the quality of the ore, to lessen the quantity of fuel and flux required to smelt, to increase the output per furnace, improve the quality of the iron and reduce the cost of handling the stock. The saving is stated to amount to $1.70 a ton of pig, to say nothing of the increased value which the iron possesses and the larger proportion of high grades.

The management of the Thomas Iron Company under Mr. B. G. Clark has thus introduced a very substantial economy, equal to a fair dividend, without reducing the price of ore or fuel. We can easily see, therefore, that this year's prices may well be retained during next year. In the West the condition is somewhat different. Lake Superior ores have risen in value during the latter part of this season, and promise to be still higher next Spring. Coke is also increased in price, so that there is a difference in the cost of stock amounting to fully $1.50 a ton on pig-iron produced. It is difficult to see where any corresponding economy can be made at the admirable works in some parts of the West, and for this reason it would seem probable that Bessemer pig will be higher next year than it has been this. If this be so the price of rails will also increase.

Scotch Pig.—There is nothing new in the Scotch pig market. The price remains absolutely unchanged both here and abroad. The small quantities coming in are absorbed with but little profit to the importers and no inducements to increase the quantity of imports. Our quotations will be found, as usual, in our table of current prices on another page.

Spiegeleisen.—There is no change in this article. It is quoted nominally at $27 for 20 per cent. English brands are a little higher, but there is but little taken of either kind.

Bessemer Pig.—This remains unchanged in price, foreign being absolutely nominal, there being no importations and no probability of any.

Structural Iron.—The demand for structural iron continues quite lively for this season of the year, and considering that building in this city has been much less than last year. The contracts for the material for the new elevated road in Jersey City for the accommodation of the Pennsylvania Railroad will absorb a good deal of iron, most of which is, however, now sold. Mills are all busy on shapes of different kinds, and anticipate a good business during the coming year with prices pretty much as they are now.

Steel Rails.—Notwithstanding the anticipated increase in the cost of Bessemer pig-iron and consequently the greater cost of making rails in the West, prices remain rather weak at our quotations. Some of the Eastern mills continue to quote at $28 and even $28.50 for small orders, but other mills consider $27 a fair figure, and the recent Vanderbilt contracts, to which we have alluded in the JOURNAL during the past few weeks, were made at prices lower than anything yet mentioned. The Scranton order was taken, it is said, at $26.50, and the Park Brothers, Pittsburg, order was taken, it is said, at $26.

Among the officers of some of the Eastern mills the next year's business is not looked upon as very promising. They think that prices will not be higher, and that the quantity of rails required will not be as great as the Western mills appear to anticipate. It is certain that unless the mileage of new roads to be built next year should be much greater than it has been this the prices of rails will not advance. This year there will probably be 7500 miles of road built, but next year many expect at least 12,000 miles of new roads, and with the present prices for old rails it is expected that a very large mileage of old roads will be relaid. At present old rails are selling at $23@$25 a ton and new rails at $26@$28 a ton.

Old Rails.—The market here is firm and stocks are light. We quote $22½ to $23 for T's and $23½ to $24 for double heads. We hear of a sale of a few thousand tons at $22½, Jersey City. For all other quotations see our Table of Current Prices on another page.

Louisville. Nov. 13.

[Special report by Messrs. HALL BROTHERS & Co.]

There are a good many orders being placed for considerable sized quantities as well as small amounts, both for as early deliveries as the furnaces can make, and extended shipments. There have been some offers made for round quantities, deliveries of which extend through next year. Some sales have been made East at prices considerably above the ruling figures in the West; in fact, at prices that can not be obtained in the West at this time. A reasonably good buying movement is looked for in the near future. We learn of some furnaces having accepted orders in the last few days at very low figures.

Quotations for cash, f.o.b. cars Louisville, will be found in our weekly register of prices.

Pittsburg. Nov. 15.

[From our Special Correspondent.]

Raw Iron.—There is a strong undercurrent of feeling that prices will advance in the near future as soon as a large amount of business that has been held back for months past shall be placed. To offset this probability, it is shown that the producing capacity of this country can be considerably increased and that an expansion of output is now in progress. So far there has been but little done, however, to indicate any special change in prices, although certain descriptions of iron could not be obtained at prices that were current a short time since. There is a feeling of confidence in the position such as the trade has not felt for a long time past, which cannot fail to help the market. The furnaces in and around Pittsburg are working to their full capacity. The advance in coke noted in our last has been maintained, nearly 13,000 ovens are in operation in the Connellsville region, new ones are building and the outlook for the coke trade is very good. Muck Bar is firm, but unchanged. Old iron rails held firmly; owners not anxious to sell. Stocks in first hands light. Scrap material active; firm.

Coal and Coke Smelted Lake Ore.

1300 Tons No. 1 Mill	16.50 cash.
1000 Tons Gray Forge	16.00 cash.
1000 Tons Bessemer, December	18.00 cash.
1000 Tons Gray Forge Extra	16.50 cash.
1000 Tons Bessemer Special	21.00 cash.
1400 Tons Gray Forge	16.00 cash.
1000 Tons Gray Forge	16.00 cash.
400 Tons Gray Forge	16.00 cash.
500 Tons Bessemer	18.00 cash.
150 Tons White and Mottled	15.00 cash.
100 Tons No. 2 Foundry	17.00 cash.

Coke, Native Ore.

1000 Tons Gray Forge	16.00 cash.
1000 Tons Gray Forge	16.00 cash.
1000 Tons Gray Forge	16.00 cash.
100 Tons Gray Forge, Storage	15.40 cash.
50 Tons Silvery No. 2	16.00 cash.
50 Tons No. 2 Foundry	17.50 4 mo.

Charcoal.

200 Tons Cold Blast	25.00 cash.
100 Tons Cold Blast	27.75 cash.
75 Tons No. 2 Foundry	22.50 cash.

Steel Slabs and Billets.

1000 Tons Rod Billets	29.25 cash.
700 Tons Billets	25.50 cash.
500 Tons Nail Slabs	28.50 cash.
500 Tons Billets	29.00 cash.
500 Tons Billets	29.00 cash.

Muck Bar.

1000 Tons Neutral, November and December	29.50 cash.
1000 Tons Neutral, " "	29.50 cash.
500 Tons Neutral, Spot	29.50 cash.
500 Tons Neutral, Spot	29.25 cash.

Old Iron Rails.

1000 Tons American T's	24.85 cash.
400 Tons American T's	25.25 cash.
200 Tons American T's	25.00 cash.
200 Tons Old Steel Rails	19.50 cash.

Ferro-Manganese.

50 Tons 80 per cent	57.00 cash.
25 Tons 80 per cent	56.50 cash.

Steel Wire Rods.

350 Tons American fine	42.00 cash

Skelp Iron.

400 Tons Narrow Grooved, per 100 lbs	1.82½ cash.
350 Tons Wide Grooved, per 100 lbs	1.90 cash.

Spiegel.

50 Tons 20 per cent	27.00 cash.

Steel Bloom Ends.	
450 Tons Bloom Ends, net	19.65 cash.
Scrap Material.	
200 Tons No. 1 Wrought Scrap, net	21.00 cash.
200 Tons No. 2 Wrought Scrap, net	19.50 cash.
200 Tons Wrought Turnings, net	14.50 cash.
200 Tons Cast Scrap, gross	16.50 cash.
200 Tons Car Wheels, gross	21.00 cash.
100 Tons Steel Tires, net	18.00 cash.
100 Tons Cast Scrap, gross	16.50 cash.
150 Tons Cast Borings, gross	12.50 cash.

Philadelphia. Nov 16

[From our Special Correspondent.]

The week's business has been distinctly light. Both makers and buyers are standing around to see how things are likely to go. There is scarcely any change in quotations. Some few people are asking more, but not getting it, and some are determined to have more money before they will sell. There is some talk of blowing in four or five anthracite furnaces, but it will be some time before this is done, even if t is attempted. Indications point to an increasing demand for forge, and to moderate demand for foundry. Buyers are obliged to take the initiative, as makers are pretty well sold up and see an enlarging demand for the future. The light stocks on consumers hands will naturally bring a good many of them into the market between now and the close of the year. The conclusion arrived at is that anthracite irons will develop strength unless there should be exceptionally large supplies from outside sources. Such a supply at present is improbable. There is a good deal of inquiry this week for blooms, but no large sales. There is also a good deal of inquiry for muck bars, but only small lots have changed hands. The bar iron market, instead of improving, as was expected, has shown some signs of weakness. One cause for this is that some large orders for car iron were placed at as low prices as were charged last August. The bar iron makers did not do this to lower rates, but to book a few big orders, thinking to make their profits off the smaller buyers. Very little skelp iron was sold this week. Quotations are unchanged. Quite a number of small buyers have been in the market during the past week. There is an inquiry for better brands. The week's business in wrought iron pipe has been light, but everything looks well for a heavy demand. Our sheet iron makers indulge in very bright prophecies for the future. Store lots are selling well. Mills are running as usual. The distribution of merchant steel is very well maintained, and prices are firm throughout. Some few orders that have been hanging fire for some time have been placed during the past six days. Makers refused to shade prices, and it was this expectation that held prices up. On angles and tees business has been somewhat irregular, as dealers became tired of waiting for buyers to come forward. The expectations are that a very large amount of business will be placed soon. Bridge plate has dropped a little. The steel rail makers are hoping for better prices as the result of the increase in orders.

There are inquiries in the market this week for from 100,000 tons to 150,000. The Pennsylvania Company and the Baltimore & Ohio want large lots. The Norfolk & Western will be in the market soon and some Georgia roads are also making inquiries for the first quarter of next year. Some buyers will not pay over $27.50. Old rails are quiet because of the determination of holders and agents to not sell below their quoted rates, which have been slightly advanced during the week. A good many sales of scrap iron were made at full prices. Selected continues scarce. Yard men have large orders in hand which they are endeavoring to close.

FINANCIAL.

NEW YORK, Friday Evening, Nov. 16.

The mining share market continues to drag along in its usual dull and uninteresting way, and there is little or nothing doing. Nevertheless, there is a brighter horizon in the West, and "great expectations" are placed on some new mines.

Boston has its copper boom still in full force, though some prudent people think it has been carried too far. New York is still nursing its few old wild cats, and hoping for the "good time coming" when a permanent interest will grow up in mining. This will come when the frauds and bubbles have been expelled, and not before.

There seems to be considerable disatisfaction among the stockholders as to the management of the company's affairs and a meeting of stockholders will shortly be held to look into the matter. A large business was again done in the stock, and the price declined from $1.65 to $1.20.

There were no dealings in Sutro Tunnel Stock. The Trust Certificates were dealt in to the extent of 7200 shares, the price advancing from 64 to 68c.

Consolidated California & Virginia declined from $11.50 to $10.25. One sale of Sierra Nevada was made at $4.75, Ophir at $8.38, Best & Belcher at $9.50. Crown Point ruled at from $8.25 to $8.13. Union Consolidated declined from $4.55 to $3.80, Exchequer from $2 to $1.85, Consolidated Imperial from $1.10 to 95c.

The Tuscaroras were neglected. Navajo shows a few sales at from $2.55 to $2.60.

Barcelona advanced from 65c. to 75c.

Buffalo Iron Mining shows still larger transactions this week. The dealings amounted to 3800 shares, and

IMPORTS AND EXPORTS OF METALS AT NEW YORK NOVEMBER 5 TO NOVEMBER 13, AND FROM JANUARY 1.

IMPORTS.

Spelter.	Week. Tons.	Year. Tons.
Am. Metal Co..	56	359
Fr'densv'eZ.Co.	.....	23
Hendricks & B..	.....	56
Lamarche's S's..	.....	6
Lewisohn Bros.	.....	61
Macy's Sons....	.....	28
Muller, S. & Co.	.....	56
Naylor & Co....	.....	214
Osgood, F.....	.....	83
Perkins, C. L...	.....	725
Pope's S's & Co.	.....	28
Total.....	56	2,139
Corres. date 1887	.....	2,911

Zinc Sheets.	Tons.	Tons.
G.A.&E.Meyer..	.....	1
Lemanche's S's.	.....	596
Milne & Co.....	.....	1
Naylor & Co....	.....	137
Total.....	.....	735

Pig Lead.	Tons.	Tons.
Am. Metal Co..	.....	22
Caswell, E. A...	.....	46
Corwith & Co...	.....	111
Hendricks Bros.	.....	122
Total.....	.....	301
Corres. date 1887	.....	3,883

Antimony.	Casks.	Casks.
Total.....	218	2,858
Corres. date 1887	74	3,297

Copper.	Pounds.	Pounds.
Lewisohn Bros. from Liverpool	.....	161,824

Nickel.	Lbs.	Lbs.
McCoy&Sanders	.....	169,586
Total.....	.....	169,586

Tin.	Tons.	Tons.
Abbott & Co....	.....	3,448
Am. Metal Co..	56	619
B'dwell&French	.....	89
CrookeS.&R.Co.	.....	469
Crooks & Co....	196	358
Davol & Sons...	7	15
Dickerson, VanD	.....	10
Funch, Edye&Co	.....	10
Hendricks Bros.	.....	181
Knauth, W. & K	.....	48
Lehnaier Sons..	7	50
Lewisohn Bros..	.....	15
Muller, S'll &Co.	.....	4,782
Nathan, Trotter	.....	22
Naumann, F....	.....	8
Naylor & Co....	28	1,698
Phelps, Dodge..	56	1,101
Pope, Jas. E., Jr.	28	168
Pope's Sons & Co	.....	124
Schwaerer Bros.	.....	7
Thomsen, A. A..	11	50
Thomson, D.....	.....	236
Total.....	330	13,456
Corres. date 1887	217	12,469

Tin Plates.	Boxes.	Boxes.
Am. Metal Co..	.....	500
Bartlett & Co..	.....	200
Bridge & Beach	.....	339
Bruce & Cook..	78	88,394
Byrne, James...	.....	47,436
Carter, G. T....	3,583	3,583
Cen. Stam. Co..	.....	34,398
Coddington &Co	3,940	144,007
Corbierre, F.& S.	1,125	3,375
Cort & Co., N. L.	900	100,390
C. Fruit Jar Co.	.....	1,366
Crocker Bros...	.....	548
Crooks & Co....	1,226	60,786
De Mill & Co...	.....	18,013
Dickerson, V. D.	721	242,348
Dolly, T. G. F...	.....	112
Fairbanks, N.H.	.....	264
Hamilton & M...	.....	362
Henly & Earle..	.....	38
Iron Clad M. Co.	.....	119
Lalance & Gr'j'n	.....	4,735
Lombard, Ayres	.....	16,965
Merchant & Co.	849	16,888
Mersick & Co...	.....	5,860
Morewood & Co	4,874	46,499
Naylor & Co....	.....	8,978
Newall Bros....	.....	208
Phelps, Dodge..	2,702	588,641
Potts, Son & Co.	.....	573
Pratt Mfg. Co..	3,856	148,362
Saunders Bros..	.....	330
Shepard & Co...	.....	77,204
Smith & L'kw'd.	.....	200
Somers Bros....	.....	768
Stroud & Co....	.....	686
Taylor, N. & G..	.....	540
Thomsen & Co..	1,665	144,105
Underhill, A. M.	.....	21
Warren & Co...	.....	1,665
Wheeler & Co..	700	8,545
Whittemore&C.	1,133	46,668
Wolff & Reesing	938	28,792
Wright & Sons.	.....	165
Total.....	28,361	1,894,955
Corres. date 1887	40,895	1,749,008

Pig-Iron.	Tons.	Tons.
Abbott & Co....	.....	600
Austin & Co....	.....	100
Baldwin Bros...	.....	100
Bartlett & Co...	200	5,100
Carter, G. T....	500	630
Crocker Bros...	765	12,532
Crooks & Co....	.....	800
Dana & Co.....	150	1,250
Downing & Co..	100	351
Drum'nd, McC'll	.....	20
Erie Despatch..	.....	250
Foley, E.....	.....	200
Gersenheimer&Co	.....	30
Hartf'd Cast.Co.	47	57
Henderson Bros.	.....	1,895
Holt, H. N.....	.....	50
Irvin & Co.....	.....	50
Knauth, N.& K.	.....	15
Lee & Co.....	.....	375
Milne & Co., A.	.....	2,467
Naylor.....	200	6,818
Perkins, C. L...	.....	5
Pierson & Co...	.....	15
Page, New'l &Co	.....	13
Pope, J. E., Jr..	.....	150
Pratt Mfg. Co..	.....	10
Sanderson&S'ns	.....	2
Stetson & Co...	100	12,907
Tonsila, M. R...	.....	120
Walbaum, W.H.	.....	400
West. Dispatch.	.....	50
Williamson &Co	200	4,800
Wright & Son..	.....	20
Total.....	2,262	51,982
Corres. date 1887	1,380	131,962

Steel Sheets, Billets, Forgings, etc.	Tons.	Tons.
Abbott & Co....	7	2,125
Arkell, Jas....	.....	17
Belcher, H. U....	15	28
Bowker, C. F...	3	291
Bruce & Cook...	.....	7
Carey & Moen..	.....	24
Carter, G. T....	.....	934
Coe, J. A.....	.....	16
Cohn, M.....	15	186
Cooney, D. J....	.....	30
Crooks & Co....	31	819
Crousbey, H....	.....	236
Dana & Co.....	.....	1,890
Downing & Co.	6	433
Henderson Bros.	.....	31
Holt, H. N.....	.....	6
Hondolette & D.	.....	136
Hugill, Chas....	6	196
Irwin & Son....	.....	1
Kunhardt & Co..	.....	33
Lalance & G....	.....	287
Lazard Freres..	.....	50
Leng, J. S.....	10	63
Lebenberg, N...	.....	36
Littlejohn, Jas.	.....	40
Lundberg, G....	77	282
Mersick & Co...	.....	128
Milne & Co.....	.....	1,857
Montgomery&C	.....	74
Moore's Son&Co	.....	25
MullerSchall&C	.....	5
Manas & Son...	.....	10
Naylor & Co....	.....	12,665
Newton&Shipm	.....	80
Oelrich & Co...	60	350
Ogd'n &Wallace	.....	326
PhelpsDodge&C	.....	3
Phœnix Steel Co	.....	20
Pierson & Co...	26	991
Pilditch, F. S...	11	349
Power, C. W....	.....	57
PrattWhi'y&Co	.....	33
Prosser, Thos..	.....	3,065
Roebling's Sons.	.....	390
Sanderson& Son	.....	42
Seaburg, C. B..	.....	2
Shotts Iron Co..	.....	15
Steinberg & Co..	2	4
Strouse & Co....	.....	50
Temple & S.....	3	15
Union Bridge Co	.....	288
Wagner, W. F..	32	1,077
Walbaum, W.H.	.....	2,479
Wallace & Co..	.....	41
Webb, J. B.....	.....	1
Wessel, Aug....	4	4
Wetherall Bros.	.....	2
Wetherill & Co.	.....	5
Wheeler & Co..	.....	12
Whiting, E. W.	.....	11
Whitney & Co..	.....	51
Williams&Whit	6	18
Wilson, J. G....	.....	112
Whittemore & C	.....	6
Wolff, R. H	13	430
Wright's S.&Co.	.....	10
Total.....	321	34,239
Corres. date 1887	315	79,779

Bar-Iron.	Tons.	Tons.
Abbott & Co....	.....	2,747
Abeel Bros.....	.....	3
Bacon & Co.....	10	160
Hugh Cranshaw	.....	1
Downing & Co..	.....	151
Holt, S. N.....	125	210
Jacobus, E. Y....	.....	16
Lilienberg, N...	.....	16
Lundberg, Gust	.....	700
Mersick & Co..	.....	29
Milne & Co.....	.....	283
Naylor & Co....	.....	515
Ogd'n &Wallace	.....	4
Page Newell &C	.....	122
Philips, C. M...	.....	20
Stroud & Co....	.....	8
Wallace & Co..	.....	19
Wilson, J. G....	.....	11
Totals.....	135	5,012
Corres. date 1887	14	13,449

Steel & Iron Rods.	Tons.	Tons.
Abbott & Co., J..	.....	6,823
Amer. Screw Co.	.....	858
Bacon & Co.....	.....	223
Baldwin B. & C.	.....	53
Bowker, C. F...	.....	3
Carey & Moen..	43	880
Cohn, M.....	.....	69
Dana & Co.....	.....	5,632
Downing & Co..	.....	347
Galpin, S. A....	.....	2,742
Heyn, A.....	.....	1,908
Hondolette & D.	.....	30
Hugill, Chas....	.....	41
Jacobus, E. Y...	.....	12
Lazard Freres..	.....	695
Leng, J. S.....	.....	850
Lilienberg, N...	.....	450
Lundberg, G....	.....	120
Milne & Co., A.	.....	1,408
Montgomery&C	.....	73
Muller, Schall&C	.....	150
Naylor & Co....	550	18,726
Newton& Ship'n	.....	2
N.Y.Barb W.Co.	.....	20
Page, Newell& C	.....	152
Perry & Ryer...	.....	100
Pierson & Co...	.....	51
Pilditch, F. S...	.....	21
Prosser, Thos...	.....	162
Roebling's Sons.	12	1,787
Sanderson& Son	.....	67
Sheldon & Co...	.....	11
Walschid, C. A.	.....	15
Washburn M.Co	.....	35
Whittemore & C	.....	1,705
Wilson, J. G....	.....	26
Wolff & Co.....	201	2,731
Total.....	806	48,265
Corres. date 1887.	1,029	120,788

Old Rails.	Tons.	Tons.
Baldwin Bros...	.....	100
Bowen'g &Arch.	.....	100
Brown B. & Co.	.....	668
Crossman & Bro	.....	1,005
D., L. & W. R. R.	.....	409
Frankfort, M...	.....	100
Geisenheimer&C	.....	100
Henderson Bros.	.....	537
Neuma'k&Gross	.....	1,912
Stetson & Co....	.....	230
Waltam & Co....	.....	300
Winter &Smil'ie	.....	80
Total.....	.....	5,541
Corres. date 1887.	2,292	149,040

Sheet Iron.	Tons.	Tons.
Bruce & Cook ..	.....	53
Coddington& Co	72	1,716
Crooks, R. & Co.	.....	10
Newton & S.....	.....	4
Thomsen & Co..	.....	2
Wagner, W. F..	.....	40
Whitney & Co..	.....	15
Wolff & R.....	.....	40
Total.....	72	1,880
Corres. date 1887.	59	1,860

Scrap Iron.	Tons.	Tons.
Abbott, A.....	.....	206
Boothby, J. H ..	.....	80
Bowring&Arch.	.....	200
Brown B. & Co..	.....	20
Burgess & Co...	.....	172
Crossman & Co.	.....	47
Froth'ham B.&C	.....	248
Geisenheimer&C	.....	565
Gerhardt, P. T..	.....	8
Johnson & Co...	.....	85
Muller, Schall&C	.....	15
Ne'mark&Gross	.....	321
Purdon & W. ..	.....	75
Salter & L.....	.....	.....
Trowbridge& Co	.....	75
Ward & Co.....	.....	150
Total.....	.....	2,157
Corres. date 1887.	100	16,778

Charcoal Iron.	Tons.	Tons.
Abbott & Co..	.....	3
Bacon & Co...	.....	102
Downing & Co..	.....	25
Lilienberg, N....	.....	15
Lunberg, G.....	.....	16
Mersick & Co...	.....	6
Milne & Co.....	.....	137
Muller, S. & Co.	.....	124
Naylor & Co....	126	888
Page, N. & Co..	.....	539
Sanderson & S.	.....	1
Total.....	126	1,909

Spiegeleisen.	Tons.	Tons.
Abbott & Co....	.....	205
Arkell, Jas.....	.....	78
Crocker Bros ...	486	6,207
Dana & Co.....	.....	4,103
Geisenheimer&Co	.....	343
Jansen, J. A....	.....	11,612
Kessler & Co...	120	120
Naylor & Co....	.....	13,496
Perkins, C. L...	.....	3,343
Pierson & Co...	.....	1,050
Post, M. & Co..	.....	320
Total.....	606	40,877
Corres. date 1887	1,296	108,919

Iron Ore.	Tons.	Tons.
Cormack & Co..	.....	1,022
Danagh & G....	.....	25
De Flores, R....	.....	7,478
Earnshaw, A...	250	6,661
Ennis & Co.....	.....	1,721
Johnston & Co.	.....	300
Naylor & Co....	.....	3,706
Outerbridge&Co	.....	340
Wright & Co...	.....	1,630
Total	250	22,833
Corres. date 1887.	3,032	50,210

EXPORTS.

Copper.	Pounds.	Pounds.
Abbott & Co....	225,000	12,810,308
Amer. Metal Co.	25,000	6,279,449
Becker & Co....	.....	1,250
Bridgpt.Copper C	.....	112,000
Copper Queen..	.....	224,034
Crooks & Co....	.....	1,000
Crossman & Bro	.....	4,000
Herold, E.....	.....	250,000
Ismay, J. B....	.....	115,000
Jones, R. W....	.....	189,984
Ladenburg & Co	.....	229,371
Ledoux & Co...	.....	110,276
Lewisohn Bros.	43,750	5,022,754
Lomal, F. A....	.....	2,691,293
Mendel, S.....	.....	560,000
Muller, Schall..	.....	1,105,000
Naylor & Co....	.....	462,709
Neumark & G...	.....	120,143
Orford Co.....	.....	574,881
Parsons & Co...	.....	420,000
Phelps, Dodge..	.....	230,664
Pope's Sons	.....	1,917,780
Todd & Co.....	.....	112,026
Wolms & Trhne	.....	99,320
Total.....	293,750	33,753,246
Corres. date 1887.	———	10,974,778

Copper Matte.		
Abbott & Co....	.....	643,592
Amer. Metal Co.	436,384	5,313,430
Kunhardt & Co.	.....	41,652
Freidensv'le Zinc Co.....	.....	56,000
Ledoux, Chas...	.....	454,000
Ledoux & Co....	.....	469,720
Lewisohn Bros..	.....	1,126,822
Nichols & Co...	.....	516,783
Wilm's, Terhune	339,685	37,746,715
Total.....	776,069	43,993,170
Corres. date 1887.	———	45,821,481

Copper Ore.		
Amer. Metal Co.	.....	524,698
Kunhardt & Co.	.....	37,682
Mallory & Co....	.....	167,065
tann, John H....	.....	28,000
Total	.....	757,445
Corres. date 1887	.....	681,068

CURRENT PRICES.

CHEMICALS.

Acid—Acetic, ℔ 100 lbs..... 2.00
Muriatic, 18°, ℔ 100 lbs ... .. 1.15@1.20
Muriatic, 20°, ℔ 100 lbs..... 1.35@1.50
Nitric, 36°, ℔ 100 lbs ..... 4.00@5.50
Nitric, 42°, ℔ 100 lbs..... 5.50@7.00
Oxalic, ℔ 100 lbs..... 8.50@9.00
Sulphuric, 60°, ℔ 100 lbs. ..... 90@95
Sulphuric, 66°, ℔ 100 lbs ..... 95@1.25
Alkali—36 p. c..... 1.12½@1.15
48 p. c ..... 1.22½@1.25
Refined, 58°..... 1.15 @1.25
Alum—Lump, ℔ lb..... 1¾
Ground, ℔ lb..... 1¾@2
Lump. ℔ ton, Liverpool £5
Sulphate of Alumina, ℔ ton..... £3 15
Aqua Ammonia—18°, ℔ lb..... 4¾
20°, ℔ lb..... 6
22°, ℔ lb..... 6@7
26°, ℔ lb..... 10@11
Ammonia—Sul., ℔ 100 lbs..... 3.35
Carb., per lb..... 7¾
Muriate per lb... ..... 6¼@8
Arsenic—White, powdered, ℔ lb.3¼@3¼
Red. ℔ lb ..... 5½@5¾
White, at Plymouth, ℔ ton. .. £11 10
Asbestos—Am., p. ton.....$20@$120
Italian, p. ton, c. i. f. L'pool ..£50@£300
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb .. .. 5@6c.
Hard, ℔ ton..... $28.00
Trinidad, refined, ℔ ton..... $30.00
Barytes—Sulph., Am. prime white17.00
Sulph., foreign, floated, p. ton....20.00
Sulph., off color, p. ton 12.50
Carb., lump, f.o.b. L'pool, ton....£6 0 0
No. 1, casks, Runcorn " "£4 10 10
No 2, bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb. ..2.06¼@2.25
Borax—℔ lb 7¾
Refined at Liverpool, ℔ ton..... .. £31
Brimstone—*See Sulphur.*
Bromine—℔ lb..... 36
Chalk—℔ ton..... 3.50
Precipitated, ℔ lb. 4
China Clay—English, ℔ ton. 18.50
Southern, ℔ ton..... 13.50
Chrome Yellow—℔ lb..... 10@25
Cobalt—Oxide, ℔ lb..... ..2.50@2.90
Copper—Sulph. English Wks.,ton£20 10s.
Precip., Eng. Wks, unit... ..fluctuating
Copperas—Common, ℔ 100 lbs... 62½
Best, ℔ 100 lbs..... 1.00
Liverpool, ℔ ton, in casks...£1 16 1.20
Cream of Tartar—Am. 90%....32@32½
Powdered, 99 p. c..... 33½
Emery—Grain, ℔ lb 4
Flour, ℔ lb 2½
Feldspar—Ground, ℔ ton.....15.00
Fuller's Earth—Lump, ℔ bbl. .90@95
Powdered, ℔ lb. 2
Gypsum—Calcined, ℔ bbl. 1.25
Iodine—Resublimed..... 3.60
Kainit—℔ ton..... 9.75@10.50
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6
White, American, in oil, ℔ lb. 6¼
White, English, ℔ lb 7½
Acetate, or sugar of.....13@13½
Lime Acetate—Amer. Brown.1.15@1.10
" Gray2.10@2.12½
Litharge—Powdered, ℔ lb..... 6@6¼
English flake, ℔ lb..... 9
Magnesite—Greek, ℔ ton..... .10.00
Manganese—lump, c.i.f. L'pool. 55s.
Per unit, up or down..... 1s. 6d.
Ground £5 10
Mercuric-Chloride—(*Corrosive Sublimate*) ℔ lb..... 55
Mineral Wool—℔ lb..... 2
Mica—In sheets according to size,
1st quality, ℔ lb.....25@$6.00
Phosphate Rock—S. Carolina,
per ton f. o. b. Charleston..... 5.00
Ground, ex vessel New York.9.50@9.75
Canadian Apatite, lump, f. o. b. at
shipping port, ℔ unit..... 24
Phosphorus—℔ lb..... 65
Plumbago—Ceylon, ℔ lb. .... 4@5
American, ℔ lb... ..... 5@7
London, ℔ cwt..... .....£0 15 0
Potassium—Cyanide, ℔ lb.... .39@40
Bromide, ℔ lb..... 37
Chlorate, ℔ lb. ....14½@14¾
Carb. ℔ lb. ....4.70@5.50
Caustic, ℔ lb..... 7¼@8
Iodide..... .....2.70@2.75
Muriate, ℔ 100 lbs..... .....1.80@1.85
Nitrate, refined, ℔ lb..... 6
Bichromate, ℔ lb 10½
Sulphate, ℔ 100 lbs. 2 30
Yellow Prussiate, ℔ lb..... 19
Red Prussiate, ℔ lb... 42
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb..... . ..... 1¾
Powdered, pure, ℔ lb. . . .. 2¼@2½
Pyrites—Non-cupreous, p. unit, s. 5d.
Quartz—Ground, ℔ ton. 18.00
Rotten Stone—Powdered, ℔ lb..3¼@3½
Lump, ℔ lb... .... 6@10
Eng., powdered, ℔ ton. £4
Lump, ℔ ton..... £5
Salt—Liverpool, ground ℔ bbl. . 75@80
Turk's Island, ℔ bbl ..... .30@33
Salt Cake—℔ 100 lbs. .....50@57
Saltpeter—Crude, ℔ lb. .... 5@5½
Refined, ℔ lb. ..... 6@8
Soda Ash—Carb.,48 % 100 lb...1.25@1.37½
High test .... 1.12½@1.15
Caustic, 48 % ....1.26¼@1.35
Soda Caustic, 60%..... 2.60@2.87½
" " 70%..... 2.40 @2.45
" " 74-5%..... 2.37½@2.45
Sal, English, ℔ 100 lbs.... .97½@1.10
Sal, American, ℔ 100 lbs .... .95 @1.20
Nitrate, ℔ 100 lbs..... .... 2.20 @2.25
Strontium—Nitrate ℔ lb. 10½
Sulphur—Roll, ℔ lb..... .... 1¾
Flour, ℔ lb 2
Crude Brimstone, 2s., ℔ ton.20.00@23.00
Crude Brimstone, 3ds, ℔ ton.19.50@21.00
Talc—Ground French, ℔ lb. 1
Domestic, ℔ lb..... .... ¼
Domestic, ℔ ton..... .... 15 00
c. i. f. Liverpool, ℔ ton..... .. £4 50
Tannin—Pure, ℔ lb. ....
Vermillion—American, ℔ lb.. .. 58
English, ℔ lb.. ..... 82@85
Vitriol—(Blue), Ordinary, ℔ lb..5¾@6¼
Extra, ℔ lb. ..... 6¼@6¾
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb..... .....6@6½
Paris, Red Seal, ℔ lb. .....6¼@7
* Spot.

BUILDING MATERIAL.

Bricks—Pale, per 1,000 ..... 2.50@2.75
Jerseys, per 1,000.. ..... 4.50@5.00
Hackensacks..... 5.00@5.25
Up Rivers, per 1000..... 5.25@5.75
Haverstraw seconds, per 1000 5.50@5.75
Haverstraw firsts, per 1,000.. 6.00@6.50
Fronts, nominal.
Croton..... .....14.00@16.00
Wilmington. .....20.00@21.00
Philadelphia..... ... ... 28.00@29.00
Trenton ..... @28.00
Baltimore..... 37.00@41.00
Building Stone—Amherst
freestone, per cu. ft.. ..... 95@1.00
Brownstone, per cu. ft. ..... 1.00@1.35
Belleville, N. J., red and gray
rock, ℔ cu. ft..... 1.00
Corncockle red freestone, ℔ cu.
ft..... 1.00
Granite, rough, ℔ cu.ft..... . 45@1.25
Granite, Scotch..... 1.00@1.05
Cement—Rosendale, ℔ bbl .90@1.00
Portland, American, ℔ bbl... 2.00@2.15
Portland, foreign, ℔ bbl.... 2.20@2.45
Keene's coarse. ..... 4.50@5.50
Keene's fine..... 7.00@8.25
Slate—Purple and green roofing, per 100 ft..... 5.00@6.00
Red roofing, per 100 sq. ft... 15.00
Black, roofing, per 100 sq. ft. 4.00@5.00
Lime—Rockland, common... 1.00@1.20
Rockland, finishing..... 1.25
St. John, com. and finish..... .90
Labor—Ordinary, per day.... 1.50@2.00
Masons, per day..... 4.00
Plasterers, per day..... 4.00
Carpenters, per day..... 3.50
Plumbers, per day..... 3.50
Painters, per day..... 2.50@3.50
Stonesetters, per day..... .3.50@4.00
Tilelayers, ℔ day..... 3.50@4.50
Bricklayers, ℔ day..... 4 00

THE RARER METALS.

Aluminum—(Metallic), per lb...$5.00
Arsenic—Metallic, per lb..... 32
Barium—(Metallic), per lb.....975.00
Bismuth—(Metallic), per lb..... 2.40
Cadmium—(Metallic), per lb....150.00
Calcium—(Metallic), per oz..... 1.50
Cæsium—(Metallic).....
Cerium—(Metallic) per oz..... .160.00
Chromium—(Metallic), per lb....200.00
Cobalt—(Metallic), per lb..... 6.00
Didymium—(Metallic), per oz. ..160.00
Erbium—(Metallic), per oz.... ...140.00
Gallium—(Metallic), per oz 3250.00
Glucinum—(Metallic) 4.50
Indium—(Metallic), per oz..... 158.00
Iridium—(Metallic), per lb.. ...650.00
Lanthanum—(Metallic), per oz.175.00
Lithium—(Metallic), per oz.....160.00
Magnesium—Per lb.... .... 4.00
Manganese—Metallic, per lb... 1.10
Molybdenum—(Metallic), per oz. 6.00
Nickel—(Metallic), per lb..... .65
Niobium—(Metallic), per oz.....128.00
Osmium—(Metallic), per lb 640.00
Palladium—(Metallic), per lb...400.00
Platinum—(Metallic), per lb. ..128.00
Potassium—Metallic, per oz... 2.00
Rhodium—(Metallic), per lb....512.00
Ruthenium—(Metallic), per oz.112.00
Rubidium—(Metallic), per oz....200.00
Selenium—(Metallic), per oz.. .. 3.00
Sodium—(Metallic) per lb. .. 4.50
Strontium—(Metallic), per oz..128.00
Tantalium—(Metallic) per oz...144.00
Tellurium—(Metallic) per oz.... 9 00
Thallium—(Metallic) per oz..... 3.00
Titanium—(Metallic) per oz....32.00
Thorium—(Metallic) per oz.....272.00
Tungsten—(Metallic) per lb..... 1.25
Vanadium—(Metallic), per oz..320.00
Yttrium—(Metallic), per oz 144.00
Zirconium—(Metallic), per oz..240.00

METALS.

Aluminum—
Bronze (10 %), ℔ lb..... 46c.
Copper—
Lake Ingot, Spot, ℔ lb.... 17·75c.
Electrolytic, ℔ lb .... 16·50c.
Casting Brands, ℔ lb. ... 16½c.
Chili Bars, London, ℔ ton £78 10s.
Sheet Copper (according to size), ℔ lb.....25 @38c.
Lead—
Domestic, Common, Spot.. 3·70c.
Foreign..... 4·70c.
Sheet, ℔ lb, net ..... 7·00c. net
Pipe, ℔ lb ... . 6c. "
Tin lined Pipe, ℔ lb..... 14c. "
Shot, ℔ lb..... 6¾c
Tin—
Tin Plates..... ..... 14s. 9d.
Tin Spot in London £101
Pig tin, spot in N. Y., ℔ lb.. 22 50c.
Zinc—
Domestic spelter, ℔ lb.... .. 5c.
Foreign spelter, ℔ lb... ... 6c.
Silesian, ton..... £19
Sheet, American, ℔ lb.... .... 6¾c.
Antimony—Hallet's, per lb.. 10¼c.
Cookson's, per lb..... .... 14c
Star Antimony..... .... £42 10s.
Quicksilver—Per lb..... .... 61@63c.
London, ℔ flask..... .....£7@£7¼

IRON AND STEEL.
New York Prices.

American Pig-Iron.—At tidewater.
No. 1 X..... .....$18.00@$19. 00
No. 2 X..... ..... 17.00@ 18.
rge. .... 16.00@ 16
Scotch Pig—Coltness... 21.25@ 21.50
Clyde .... @ 20.25
Dalmellington..... .... @ 20.25
Summerlee..... 21.00@ 21.50
Shotts..... 21.00@.....
Langloan ..... 20.00@ 21.50
By Cable to-day to the Metal Exchange :
Scotch Warrants.....41s. 2d.
Coltness, at Glasgow ..... .49s. 3d.
Langloan, at Glasgow.....49s. 3d.
Summerlee, at Glasgow.....49s. 6d.
Gartsherrie, at Glasgow.... .47s. 3d.
Glengarnock, at Ardrossan.....47s. 6d.
Dalmellington, at Ardrossan.....42s. 6d.
Eglinton, at Ardrossan ..... .41s. 6d.
Bessemer Pig—
Foreign, nominally..... $19.00@$20.00
Domestic ... . 16 60@ 17.00
Spiegeleisen—
German, 20 per cent..... 26.50@ 27.00
English, 20 " " ..... 27.00@ 27.00
" 30 " " ..... 32.00@ 33.00
Ferro Manganese, 80%.... 54.00@ 54.50
Steel Blooms, nominally ....
Steel Billets, " 32.00@ 36.00
Steel Nail Slabs, " 29.00@ 29.50
Steel Wire Rods, " 39.75@ 40.00
Steel Rails—
Heavy sections, at mill.... 28.00@ 28.50
Light " " .... 30.00@ 34.00
Structural Iron and Steel—
Bridge Plate, at mill.. .....2·0 @2·1c.
Angles, at mill ..... 2·00@2·10c.
Tees, at mill..... . ..... 2·40@2·60c.
Steel Angles, at mill..... ...2¼ @2¾c.
Beams and Channels, on wharf, 3·3c.base.
Steel Plates—
Tank and Ship, on wharf.....2 25@2·3
Shell, on wharf..... ....2·4 @2·5
Flange, " ..... 2·6 @2¾
Fire-Box, on wharf..... 3½ @4
Iron Plates—
Common tank, on wharf....2·1@2·2c.
Refined, on wharf.....2·3@2·4c.
Shell, " ..... 2·3@2·4c.
Flange, " ..... .3·4@3·5c.
Extra flange, on flange.....3¾@4
Bar Iron—
Refined..... .....1·7 @1·9c.
Common ....1·65@1·80c.
Merchant Steel—
American tool .... 8½@10c.
Special grades..... 13 @20c.
Crucible machinery ..... 5 @6c
" spring..... ..... 4½c.
Bessemer machinery..... .... 2·2@2·5c.
" spring. ..... 2·7@2·9c.
Cast-Iron Pipe—At works:
According to size..... $25 00@$31.00
Wrought-Iron Pipe—nominally—
Butt-Welded, Plain and Tarred, 52½% disc; Galv.. 42½% disc.
Lap-Welded, Plain and Tarred, 62½% disc; Galv., 52½% disc.
Boiler Tubes—Per cent disc..60@62½%
Rail Fastenings—
Spikes..... .... 2·2@2·25c. delv'd
Angle Fish-bars..... .1 9 @2c.
Bolts and Sq Nuts.....2·9 @3c
" Hex. " .....3·1 @
Wrought Scrap—
Foreign, *ex store*..... @
No. 1 Yard *to vessel*..... 20.50@ 21.50
Cast Scrap .... 15.50@ 16.50
Old Car Wheels..... ... 17.00@ 18.00
Old Rails—Tees ... . 23.00@ 24.00
—Doubles ..... 24.00@ 25 00
Nails—In car-load lots. .. 1 90@ 2·0c.
—From store.. .... 1·95@ 2.00

Louisville Prices.

Hot Blast Irons—
So. Coke, No. 1..... ....$17.50@$18.00
" " No. 2..... 16 50@ 17.00
" " No. 2½ ..... 16.00@ 16.50
Mahoning Valley (Lake Ore Mixture) .... 20.00@ 21.00
So. Charcoal, No. 1..... 18.00@ 18.50
" " No. 2..... 17.00@ 17.50
Missouri Charcoal No. 1.... 19.50@ 20.00
" " No. 2.... 19.00@ 19.50
Forge Irons—
Neutral Coke..... .....$14.75@$15.25
Cold Short ..... 14.25@ 14.75
Mottled..... 19.00@ 19.50
Car Wheel and Malleable Irons—
Southern (standard brands).$22.00@$25.00
" (other brands)..... 18 00@ 18 50
Lake Superior..... .. 22.50@ 23.50

Pittsburg Prices.

Coke or Bituminous Pig—
Foundry No. 1..... ... ...$17.75@18.00
Foundry No. 2..... ..... 16.75@17.00
Gray Forge No. 3..... ..... 16.00@16.50
" " No. 4.. ... ... 15.50@15.75
White .... 15.00@15.50
Mottled..... ..... 15.25@15.50
Silvery .... 16.50@18.50
Bessemer..... ..... 17.50@18.00
Low Phos..... ..... 21.00@21.50
Charcoal Pig—
Foundry No. 1. .... 23.50@24.50
Foundry No. 2..... . . 22.00@24.00
Cold-Blast..... ..... 25.00@27.00
Warm-Blast..... ..... 24.00@25.00
20 p. c. Spiegel..... ..... 27.00@28.00
Muck-Bar..... ..... 29.25@30.00
Steel Blooms..... .... 29.00@29.50
Steel Slabs .... 28.50@28.75
Steel Crop Ends..... ..... 19.50@20.00
Steel Bloom Ends..... .....@19.50
Ferro Manganese, 80%.. . ... 56.50@57.00
Steel Billets..... ..... 29.00@29.50
Old Iron Rails..... .. 24.85@25.25
Old Steel Rails..... ... . 19.00@20.00
No. 1 W. Scrap..... ..... 21.00@21.50
No. 2 W. Scrap.. . ..... 18.50@19.50
Steel Rails..... .....*9.00@ ....
" light sections..... .....*29.00@32.00
Bar Iron, nominal..... 1 75@ 1.80
Nails .... $2.00 usual discount
Steel Nails..... ....$2.50
Two per cent off for cash. *At works.

Philadelphia Prices.

Foundry No. 1..... $18.00@19.50
Foundry No. 2..... 17.00@18.00
Gray Forge..... 17.00@16.50
Bessemer Pig..... ..... 19.50@20.50
Steel Rail Blooms..... 29.50 nom
Foreign Bessemer..... .....@20.50
Spiegeleisen. ..... 26.50@27.00
Scrap, Selected..... 22.00@23.00
No. 1..... ... . 21.00@22.00
Cargo Scrap..... ... . 21.00@21.50
Muck-Bars..... ... . 29.00@30.00
Merchant Iron..... . ... 1.75@ 1.95
Plate Iron..... .... 2.00@ 2.10
Tank Iron ..... 2.00@ 2.15
Skelp Iron..... 1.95@ 2.00
Angles..... ... ...@ 2.10
Beams and Channels..... .. 3.30@.....
Nails..... ... . 1.90@ 2.00
Steel Rails..... 27.00@29.00
Old Rails..... 23.50@24.00

STOCK MARKET QUOTATIONS

Baltimore, Md.

Company.	Bid.	Asked.
Atlantic Coal....	.....	1.10@1.90
Balt. & N. C.....	.28@.28	.30
Conrad Hill.....	....	.15
Diamond Tunnel	.40	.....
George's Crk. C.	103¾	110.00
Lake Chrome..	.05	. ..
N. State, Balto..	....	...
Silver Valley....	.80	.90@1.00

Highest and lowest prices bid and asked during the week ending November 15th.

Birmingham, Ala.

Company.	Bid.	Asked.
Ala. Conn. C..	12½	25 @ 40
Bir. Min. & Mfg.	....	160 @170
Bir. Fur. & Mg.	10	16
Broken Arrow C. & M....	....	12¾@ 16
Decat. L. Imp. & Fur 11	@11⅝	11½@ 12
Decatur Min. L.	. .	23 @ 25
Enterprise Mfg. Co	....	50
Jagger-Townley C. & C. Co.	5	9 @ 11
Mag-Ellen C. & Mg	75	100
No Bus. Crk., C. & Mg.....	3¾	4¼@ 7½
Sloss I. & S.... 25	@27½	27½@ 29½
* Sloss I. & S.. 84	@85¼	89
Sheffield C. & I. 65	@74½	67 @ 70
Tenn. C. & I. Co. 32	@3⅝¾	37 @ 37½
* William son Iron Co.....	99¾	.....
WoodstockS&I	51½@56½	57 @ 59

* Bonds.

Highest and lowest prices bid and asked during the week ending November 13th.

Pittsburg, Pa.

Company.	H.	L.	Closing.
Bridgewater Gas.	50.00	35.00	50.00
Chartiers Val. Gas.	50.00	50.00	50.00
La Noria Mining ..	2.00	1.50	2.00
Natural Gas Co. of W. Va....	50.00	50.00	50.00
N. Y. & C. Gas Coal.	35.50	31.00	31.00
Penn Gas Co ...	21.00	21.00	21.00
Philadelphia Co...	40.63	40.38	40.50
Silverton Mg.... ..	1.50	1.50	1.50
Washington Oil...	67.50	67.50	67.50
Westinghouse Air Brake Co....	119.00	117.00	119.00
Wheeling Gas ...	27.00	25.25	25.25
Yankee Girl Mg..	5.00	5.00	5.00

Highest and lowest prices bid and asked during the week ending November 14th.

Foreign Quotations.

London. November 3.

Company.	Highest.	Lowest
Alturas Gold, Idaho...	6s.	5s. 6d.
Arizona Copper, Ariz..	18s. 6d.	18s.
Birdseye Creek, Cal....	6s.	5s.
Carlisle, N. Mex	16s.	15s.
Colorado United, Colo..	4s.	3s.
Columbian, S. A.....	£1⅜	£1¼
Cons. Esmeralda, Nev..	7s.	6s. 6d.
Denver Gold, Colo.....	2s.	1s. 6d.
Dickens Custer, Idaho.	4s. 9d.	4s. 3d.
Eberhardt, Nev	2s.	1s. 6d.
El Callao, Venezuela....	£3¼	£2¾
Empire, Mont	£1 7-16	£1 5-16
Flagstaff, Utah.....	3s. 6d.	2s. 6d.
Garfield, Nev....	16s. 6d.	14s. 6d.
Gold Hill, N. C.....	1s. 6d.	1s.
Ilex, Cal	£¾	£⅝
Josephine, Cal	8s. 9d.	6s. 3d.
Kohinoor, Colo.....	2s. 9d.	2s. 3d.
Mason & Barry, Portugal	£12¼	£12
Montana Lt., Mont	£2 3-16	£2 1-16
New California, Colo...	9s.	8s. 6d.
New Emma, S., Utah...	5s.	4s. 6d.
New Hoover Hill, N. C.	2s.	1s. 6d.
New La Plata, Colo...	2s. 6d.	2s.
Pittsburg Cons., Nev...	£1½	£1
Quebrada, Venezuela,..	£6¼	£6¼
Richmond Con., Nev...	£3¼	£3
Ruby & Dunderberg, Nev	2s.	1s.
Russell Gold, N. C.....	4s.	3s.
Sierra Buttes, Cal....	£⅜	£⅛
Stanly, N. C....	7s. 6d	5s.
U. S. Placer, Colo.....	8s. 6d.	7s. 6d.
Viola Lt., Idaho	16s. 6d.	15s. 6d.

*Paris.** November 1.

El Callao.....	70.00	70.00
Golden River....	405	410
Lexington.	110	110
" parts..... .	5.25	5.25
Rio Tinto.....	638.75	638.75
" obligations...	516.25	516.25
" " 2d.	507.50	507.50
Tharsis	162.50	162.50

* Francs.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last.	Dividends. Total paid.	Dividends. Date and amount of last.
1	Adams, g. L.	Colo.	$1,500,000	150,000	$10	*		
2	Alice, s. c.	Mont	10,000,000	400,000	25	*		
3	Alturas, g.	Idah.	1,500,000	300,000	5			
4	Amy & Silversmith, s.	Mon.		341,419				
5	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl. 1875	$1.00
6	Argenta, s.	Nev.	10,000,000	100,000	100	325,000	July 1885	.10
7	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*		
8	Aurora, L.	Mich	2,000,000	100,000	20			
9	Bassick, G. S.	Colo.	10,000,000	100,000	100	*		
10	Belle Isle, s.	Nev.	10,000,000	100,000	100	145,000	Feb 1887	.20
11	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,770,000	Sept 1888	.50
12	Bellevue Idaho, s. L.	Idah.	1,250,000	125,000	10	57,500	Nov. 1887	.25
13	Black Bear, G.	Cal.	3,000,000	30,000	100	22,500	Dec. 1884	.25
14	Bodie Con., G. S.	Cal.	10,000,000	100,000	100	500,000	Sept 1888	.50
15	Bonanza Developm't	C & M	3,000,000	300,000	10			
16	Bonanza K'g, Cons. s.	Cal.	1,000,000	100,000	10	*		
17	Boston & Mont, G.	Mon.	2,500,000	250,000	10	*		
18	Boston & Mont., C. S.	Mon	2,500,000	100,000	25	*		
19	Breece, s.	Colo		200,000	25	*		
20	Brooklyn Lead, L. S.	Utah	500,000	50,000	10	*		
21	Bulwer, G.	Cal.	10,000,000	100,000	10	80,000	May 1888	.20
22	Caledonia, G.	Dak.	10,000,000	300,000	100	505,000	May 1885	.15
23	Calumet & Hecla, C.	Mich	2,500,000	100,000	25	1,200,000		
24	Carbonate Hill s. L.	Colo.	1,500,000	200,000	10	*		
25	Castle Creek, G.	Idah.	100,000	100,000	1			
26	Catalpa, s. L.	Colo.	3,000,000	300,000	10	*		
27	Central, C.	Mich	500,000	20,000	25	100,000	Sept 1861	.06
28	Chrysolite, s.	Colo.	10,000,000	200,000	50	*		
29	Colorado Central, s. L.	Colo.	2,750,000	275,000	10	*		
30	Confidence, s. L.	Nev.		24,980		287,449	Apl. 1887	.50
31	Cons. Cal. & Va., G. S.	Nev.	21 600 000	216,000	100	108,000	Jan. 1885	.20
32	Contention, s.	Ariz.	12,500,000	250,000	50			
33	**Cop. Queen Cons, C.	Ariz.	1,400 000	140,000	10			
34	Crescent, s. L. S.	Utah	15,000,000	600,000	25	*		
35	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,825,000	Oct. 1888	.50
36	Daly, s. L.	Utah	3,000,000	150,000	20	*		
37	Deer Creek, s. G.	Idah.	1 000 000	200,000	5	*		
38	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*		
39	Derbec B. Grav., G. S.	Cal.	10,000,000	100,000	100	90,000	Dec. 1881	.10
40	Dunkin, s. L.	Colo.	5,000,000	200 000	25			
41	Eclipse	Colo.	100,000	100,000	1			
42	Elkhorn, G. S.	Mont	1,000,000	20,000	10	50,0 0	July 1883	.50
43	Empire Lt., G.	Mont	500,000	100,000	5	*		
44	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	500,000	July 1888	1.00
45	Evening Star, s. L.	Colo.	500,000	50,000	10	*		
46	Excelsior, G.	Cal.	10,000,000	100,000	100	560,000	Sept 1865	1.00
47	Father de Smet, G.	Dak.	10,000,000	100 000	100	200,000	Nov 1878	1.00
48	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun. 1871	
49	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*		
50	Fresno Enterprise, G.	Cal.	5,000,000	100,000	50	*	Mch 1883	.10
51	Garfield Lt., G. S.	Nev.	500,000	100,000	5			
52	Golconda, G. S.	Idah.	1,000,000	100,000	10			
53	Gould & Curry, G. S.	Nev.	10,300,000	103,000	100	5,355,000	Oct. 1888	.50
54	Grand Central, S.	Ariz.	1,000,000	100,000	10			
55	Grand Prize, s.	Nev.	10,000,000	100,000	100	595,000	Oct. 1888	.25
56	Granite, S.	Colo.	125,000	125,000	1			
57	Granite Mountain, s.	Mont	10,000,000	400,000	25	*		
58	Green Mountain, G.	Cal.	1,250,000	125,000	10	*		
59	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	5,086,000	July 1887	.50
60	Hall-Anderson, G.	N. S.	150,000	150,000	1			
61	Hecla Con., S. & L. C.	Mont	1,500,000	30,000	50	*		
62	Hoist & Mg & Red, G. & L.	Mont	3,315,000	663,000	5	*		
63	Holmes, S.	Nev.	10,000,000	100,000	100	300,000	Sept 1885	.10
64	Holyoke, G.	Idah	200,000	200,000	1			
65	Homestake, G.	Dak.	12,500,000	125,000	100	300,000	July 1878	1.00
66	Honorine, S. L.	Utah	500,000	250,000	2	25,000	Jun. 1883	
67	Hope, S.	Mont	1,000,000	100,000	10	*		
68	Horn-Silver, S. L.	Utah	10,000,000	400,000	25	*		
69	Hubert, G.	Colo.	500,000	50,000	10	*		
70	Idaho, G.	Cal.	310,000	3,100	100			
71	Ideal, S. L.	Colo.	1,500,000	50,000	10			
72	Illinois, S.	N. M.	100,000	100,000	1	*		
73	Independence, S.	Nev.	10,000,000	100,000	100	340,000	Oct. 1886	.20
74	Indian Queen, S.	Nev.	250,000	125,000	2			
75	Iron Hill, S.	Dak.	2,500,000	250,000	10	118,750	Sept 1888	.03
76	Iron Silver, S. L.	Colo.	10,000,000	500,000	20	*		
77	Jackson, G. S.	Nev.	5,000,000	50,000	100	10,000	Nov 1880	.20
78	Jay Gould	Mont	2,000,000	4 000	5	*		
79	Jocuistita, S.	Mex.	2,500,000	250,000	10			
80	Jumbo, G.	Colo.	2,000,000	200,000	10			
81	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov 1881	.30
82	La Plata, S. L.	Colo.	2,000,000	200,000	10	*		
83	Leadville Cons., S. L.	Colo.	4,000,000	400,000	10	*		
84	Lexington, G. S.	Mont	4,000,000	40,000	100	*		
85	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*		
86	Little Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*		
87	Manhattan, S.	Nev	5,000,000	50,000	100	250,000	Dec. 1887	1.00
88	Marion Bullion, G.	N. C.	500,000					
89	Martin White, G.	Nev.	10,000,000	100,000	100	1,150,000	Mar. 1886	.25
90	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*		
91	Minnesota, C.	Mich	1,000,000	40,000	25	420,000	Apl. 1886	1 00
92	Mono, G.	Cal.	5,000,000	50,000	100	641,000	Sept 1888	.50
93	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*		
94	Morning Star, S. L.	Colo.	1,000,000	100,000	10	*		
95	Moulton, G.	Mont	2,000,000	400,000	5	*		
96	Mount Pleasant, G.	Cal.	150,000	150,000	1	*		
97	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	Jun. 1880	2.00
98	Napa, G.	Cal.	700,000	100,000	7			
99	Navajo, G. S.	Nev.	10,000,000	100,000	100	485,000	Apl. 1888	.30
100	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*		
101	Northern Belle, S.	Nev.	5,000,000	50,000	100	425,000	Jan. 1884	8.30
102	North Belle Isle, S.	Nev.	10,000,000	100,000	100	300,000	Oct. 1888	.50
103	Occidento, S. L.	Utah	5,000,000	50,000	100			
104	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,100,440	Sept 1888	.50
105	Original, S. C.	Mont	1,500,000	60,000	25	*		
106	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl. 1876	1.60
107	Oxford, G.	N. S.	125,000	125,000	1	*		
108	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	62,000	Apl. 1888	.15
109	Parrott, C.	Mont	1,800,000	180,000	10	*		
110	Peacock, G. C.	N. M.	2,000,000	200,000	10	*		
111	Pleasant Valley, G. S.	Cal.	10,000,000	100,000	100	40,000	Mar 1884	.10
112	Platus, G. S. C. L.	Colo.	2,000,000	200,000	10	*		
113	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*		
114	Prussian, S. L.	Colo.	1,500,000	150,000	10	*		
115	Quicksilver, pref., G.	Cal.	4,300,000	43,000	100	*		
116	Quicksilver, com., G.	Cal.	5,700,000	57,000	100	*		
117	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec. 1862	
118	Richmond, S. L.	Nev.	1,350,000	54,000	25	*		
119	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar 1886	.50
120	Rising Sun, S.	Dak.	750,000	150,000	5	*		
121	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*		
122	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20	*		
123	Rooks, G.	Vt.		50,000	10	*		
124	Savage, S.	Nev.	11,200,000	112,000	100	6,436,000	Oct. 1888	.50
125	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*		
126	Shoshone, G.	Idah.	150,000	150,000	1	*		
127	Sierra Buttes, G.	Cal.	2,225 000	122,500	10			
128	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	6,125,000	July 1888	.25
129	Sierra Nevada, S. L.	Idaho	1,000,000	1	1	*		
130	Silver Cord, G. S. L.	Colo.	5,000,000	500,000	10	*		
131	Silver King, S.	Ariz.	10,000,000	100,000	100	50,000	Jun. 1888	.50
132	Silver Mg. of L. V.	N. M.	500,000	500,000	1	*		
133	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*		
134	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*		
135	Smuggler, S. L.	Colo.	600,000	60,000	10	*		
136	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct. 1886	.25
137	Standard, G. S.	Cal.	10 000,000	100,000	100	25,000	Oct. 1884	.25
138	Stormont, S.	Utah	500,000	500,000	1	*		
139	St. Joseph, L.	Mo.	1,500,000	150,000	10	*		
140	Surinam, G.	D. G.	3,000,000	600,000	5	*		
141	Swansea, G.	Colo.	600,000	60,000	10	*		
142	Syndicate, G.	Cal.	10,000,000	100,000	100	38,729	July 1882	.15
143	Tamarack, C.	Mich.	1,000,000	40,000	25	520,000	Apl. 1885	3.00
144	Tip Top, S.	Ariz.	10,000,000	100,000	100	250,000	Sept 1883	.25
145	Tombstone, S. & L.	Ariz.	12,500,000	500,000	25	*		
146	United Verde, C.	Ariz.	3,000,000	300,000	10	*		
147	Valencia, M.	N. H.	150,000	1,500	100	*		
148	Viola Lt., S. L.	Idah.	750,000	150,000	5	*		
149	Yankee Girl	Colo.	2,500,000	250,000	10	*		
150	Yellow Jacket, G. S.	Nev.	12,000000	120,000	100	5,448,000	Dec 1885	.75

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par Value.	Assessments. Total levied.	Assessments. Date & am't of last.	Dividends. Total paid.	Dividends. Date and amount of last.
1	Agassiz Cons., s. L.	Colo.	$3,500,000	50,000	$50	*		
2	Alloues, C.	Mich	2,000,000	80,000	25	$657,000	Jun. 1868	1.00
3	Alpha Con., S. S.	Nev.	3,000,000	30,000	100	562,500	Nov. 1888	37½
4	Alta, s.	Nev.	10,080,000	100,800	100	2,241,600	Sept 1888	.50
5	Amador, G.	Cal.	400,000	200,000	2	*		
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000	Jun 1877	.50
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5			
8	Appalachian, Lt., G.	N. C.	155,000	300,000	5			
9	Barcelona, G.	Nev.	5,000,000	200,000	25	*		
10	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500	Jan. 1883	.10
11	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	Apl. 1886	.10
12	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,054,590	Oct. 1888	.25
13	Big Pittsburg, s. L.	Colo.	20,000,000	200,000	100	*		
14	Bi-Metallic, s.	Mon.	5,000,000	200,000	25	*		
15	Black Oak, G.	Cal.	3,000,000	300,000	10			
16	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000	Nov 1883	.25
17	Bremen, s.	N. M.	5,000,000	500,000	10	*		
18	Brunswick, G.	Cal.	2,000 000	400,000	5	*		
19	Bullion, G. S.	Nev.	10,000,000	100,000	100	4,007,000	Aug. 1888	.50
20	Bve and Bye	Ariz.	1,000,000	100,000	10	*		
21	Calaveras, G.	Cal.	500,000	500,000	1	*		
22	Carisa, G.	Colo.	500,000	100,000	5	*		
23	Carupano, G. S. L. C.	Ven.		200,000	2	*		
24	Cashier, G. S.	Colo.	500,000	250,000	2	*		
25	Cen. Contin'l, G. S. L.	C. & A	2,000,000	200,000	10	*		
	aries Dickens, G. S.	Idah.	1,250,000	250,000	5	*		
26	Cherokee, G.	Cal.	1,500,000	150,000	10			
27	Chollar	Nev.	11,200,000	112,000	100	1,320,000	Oct. 1888	.50
28	Cinnamon Mt., G. S.	Colo.	750,000	150,000	5	*		
29	Cleveland, T.	Dak.	1,000,000	500,000	2	*		
30	Colchis	N. M.	500,000	50,000	1			
31	Comstock, G. S.	Nev.,	10,000,000	100,000	100	30 000	Mar. 1887	.15
32	Con. Imperial, G. S.	Nev.,	5,000,000	50,000	100	1,175,000	Sept 1887	.25
33	Con. Pacific, G.	Cal.	6,000 000	60,000	100	177,000	Sept 1887	.10
34	Cons. Silver, S.	Mo.	2,500,000	250,000	10			
35	Courtlandt, C.	Colo.	500,000	50,000	10			
36	Crescent, s. L.	Colo.	3,000,000	300,000	10	*		
37	Crocker, S.	Ariz.	10,000,000	100,000	100	105,000	Feb. 1888	.20
38	Crowell, G.	N. C.	500,000	500,000	1	*		
39	Dahlonega, G.	Ga.	250,000	250,000	1	*		
40	Dandy, s.	Colo.	5,000,000	500,000	10			
41	Dandelion, s.	Colo.	1,000,000	100,000	10	*		
42	Decatur, s.	Colo.	1,500,000	300,000	5	*		
43	Denver City, s. L.	Colo.	5,000,000	500,000	10	*		
44	Denver Gold, G.	Colo.	300,000	60,000	5	*		
45	Durango, G.	Colo.	500,000	500,000	1	*		
46	Eastern Dev. Co., Lt.	N. S.	1,500,000	150 000	10	990,000	Mar. 1886	1.00
47	El Cristo, G. S.	U.S.C	1,000,000	500,000	2	*		
48	El Dorado, G.	Cal.	1,000,000	250,000	4	*		
49	El Talento, G.	U.S.C	1,000,000	520,000	2			
50	Empire, S.	Utah	10,000,000	100,000	100	*		
51	Eureka Tunnel, s. L.	Nev.	10,000,000	100,000	100	*		
52	Exchequer	Nev.	10,000,000	100,000	100	790,000	Sept 1888	.20
53	Found Treasure, G. S.	Nev.	10,000,000	100,000	100	18,030	July 1888	.06
54	Gogebic Syn., I.	Wis.	5,000,000	200,000	25	*		
55	Gold Cup, S.	Colo.	500,000	500,000	1	*		
56	Golden Era, S.	Mon.	2 000,000	200,000	10	*		
57	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec. 1885	.25
58	Gold Rock, G.	Cal.	1,000,000	500,000	2	*		
59	Goodshaw, G.	Cal.	10,000,000	100,000	100	*		
60	Grand Belt, C.	Tex.	12,000,000	120,000	100			
61	Grand Duke	Colo.		800,000	80,000	10		
62	Great Remance, G.	U.S.C	1,000,000	500,000	2	*		
63	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*		
64	Gregory Con., G.	Mon.	3,000,000	300,000	10			
65	Hariem M. & M. Co, G.	Cal.	1 000,000	200,000	5			
66	Head Cent. & Tr. s.	Ariz.	10,000,000	100,000	100			
67	Hector, S.	Cal.	1,500,000	300,000	5			
68	Highland, C.	Mich	500,000	25,000	25			
69	Hollywood	Cal.	200,000	100,000	2			
70	Hortense, s.	Colo.	2,000,000	200,000	10			
71	Huron, C.	Mich	1,000,000	40,000	25	280,000	May 1887	3.00
72	Iron Gold & Silver, s.	N. M.	2,000,000	200,000	10	*		
73	Ironton, L.	Wis.	1,000,000	40,000	25			
74	Iroquois, C.	Mich	1,250,000	50,000	25			
75	J. D. Reymert.	Ariz.	10,000,000	100,000	100	*		
76	Julia Cons., G. S.	Nev.	11,000,000	110,000	100	1,650,000	Apl. 1887	.10
77	Kearsarge, C.	Mich	1 250,000	50,000	25	190,000	Oct. 1887	1.00
78	Lacrosse, G.	Colo.	1 000,000	100,000	10			
79	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*		
80	Lucerne, G.	Colo.	5,000,000	500,000	10			
81	Mammoth Bar, G.	Cal.	10,000,000	100,000	100	50,000	Dec. 1881	
82	May Belle, G.	Cal.	10,000,000	100,000	100	84,000	Mar. 1884	.15
83	Mayflower Gravel.	Cal.	1,000,000	100,000	10	425,000	July 1888	.50
84	Medora, G.	Dak.	250,000	250,000	1			
85	Mexican, G. S.	Nev.	10,000,000	100,000	100	2,725,760	Aug. 1888	.25
86	Middle Bar G.	Cal.	400,000	200,000	2	*		
87	Mill & Starr, S. L.	Utah	1,000,000	200,000	5	*		
88	Monitor, G.	Colo.	100,000	100,000	1	*		
89	Moose Silver, s.	Colo.	3,000,000	300,000	10	*		
90	Native, C.	Mich	1,000,000	40,000	25			
91	Neath, G.	Colo.	1,000,000	100,000	10			
92	Nevada Queen, S.	Nev	10,000,000	100,000	100	130,000	Dec. 1887	.50
93	New Germany, G.	N. S.	1,000,000	100,000	1	*		
94	New Kansas, G. L.	Colo.	2,000,000	200,000	10	*		
95	North Standard, G.	Cal.	19,000,000	100,000	100	20,000	Nov	
96	Noonday	Cal.	600,000	60,000	10	208,000	Dec. 1881	.10
97	Oneida Chief, G.	Cal.	500,000	125,000	4	*		
98	Oriental & Miller, S.	Nev.,	10,000,000	400,000	10			
99	Osceola, G.	Nev.,	5,000,000	50,000	25			
100	Overman, G. S.	Nev.	11,520,000	115,200	100	3,737,180	Aug. 1887	.25
101	Park, S.	Utah	2,000,000	112,000	10	1,349,600	July 1885	.50
102	Peer, S.	Ariz.	10,000,000	100,000	10	185,000	Nov. 1886	.10
103	Peerless, S.	Ariz.	10,000,000	100,000	100	345,000	Apl. 1888	.25
104	Phœnix	Ariz.	500,000	500,000	100	*		
105	Phœnix, G. S.	Ark.	5,000,000	200,000	1	*		
106	Phœnix Lead, S. L.	Colo.	100,000	100,000	25	*		
107	Pilgrim, G.	Cal.	600,000	300,000	1			
108	Plumas Eureka	Nev.	11,200,000	112,000	100	1,349,600	July 1885	.50
109	Proustite, S. L.	Idah	250,000	250,000	100	*		
110	Puritan S. G.	Colo.	1,500,000	150,000	1	*		
111	Quincy	Colo.	3,000,000	300,000	10	*		
112	Rappahannock, G. S.	Va.	250,000	250,000	10	*		
113	Red Elephant, S.	Colo.	500,000	500,000	1	*		
114	Ropes, G. S.	Mich	2,000,000	80,000	1	103,200	July 1887	.50
115	Rough, C.	N. C.	1,500,000	300,000	25	*		
116	Sampson, G. S. L.	Utah	10,000,000	100,000	5	288,157	July 1888	1.00
117	San Sebastian, G.	San.S	1,600,000	320,000	5	*		
118	Santiago, G.	U.S.C	400,000	1,200,000	2	*		
119	Security, G.	Colo.	10,000,000	1,000,000	10			
120	Sheridan	N.M.	2,000,000	200,000	10	*		
121	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*		
122	South Bulwer, G.	Cal.	10,000,000	100,000	100	100,000	May 1881	.25
123	South Hite	Cal.	10,000,000	100,000	100	195,000	Jan. 1883	.05
125	South Pacific	Cal.	500,000	100,000	5	*		
126	Stanislaus, G.	Cal.	2,000,000	200,000	10	*		
127	State Line, S.	Nev.	250,000	250,000	1	*		
128	St. Kevin, G. S.	Colo.	100,000	100,000	1	*		
129	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*		
130	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10			
131	St. L. & St. Felipe, G. S.	Mex.	1,500,000	150,000	10			
132	St L. & Sonora, G. S.	Mex.	1,500,000	150,000	10			
133	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*		
134	Sunday Lake, I.	Mich	1,250,000	50,000	25			
135	Sullivan, G. S. L.	Me.	500,000	100,000	5	125,000	Dec. 1886	.25
136	Sutro Tunnel	Nev.	20,000,000	2,000,000	10	*		
137	Sylvanite, S.	Colo.	5,000,000	500,000	10	*		
138	Taylor-Plumas, G.	Cal.	1,000,000	200,000	5	10,000	Feb. 1888	.03
139	Tioga Cons., G.	Cal.	10,000,000	100,000	10	205,0.0	May 1888	.10
140	Tornado Cons. G. S.	Nev.,	100,000	100,000	1	*		
141	Tortilita, G. S.	Ariz.	1,000,000	100,000	2	*		
142	Tuscarora, S.	Nev.	10,000,000	500,000	100	110,000	Oct. 1881	.15
143	Union Con., G. S.	Nev.	10,000,000	100,000	100	2,185,000	Nov. 1887	.50
144	Utah, S.	Nev.	10,000,000	100,000	100	120,000	Oct. 1888	.25
145	Washington, C.	Mich	1,000,000	40,000	25	*		
146	West Granite Mt., S.	Mon.	5,000,000	500,000	10	*		
147	Zelaya, G. S.	C. A.	600,000	300,000	2	*		
148								
149								

G. Gold. S. Silver. L. Lead. C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. ‖ The Deadwood Virginia, $24, previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1884, the California had paid $31,320,000 in dividends, and the Con. 390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ 1,000,000.

NON-DIVIDEND-PAYING MINES.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Nov. 10. H.	Nov. 10. L.	Nov. 12. H.	Nov. 12. L.	Nov. 13. H.	Nov. 13. L.	Nov. 14. H.	Nov. 14. L.	Nov. 15. H.	Nov. 15. L.	Nov. 16 H.	Nov. 16 L.	Sales.
Adams, Colo.	....	.....	....	....	.....	....	....	.....	...	....	1 00	....	100
Alice, Mont	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Argenta, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Rassick, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Belcher, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Belle Isle, Nev.	....	.....	....	....	2 05	....	....	.....	2.00	....	....	....	100
Bodie Cons., Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Breece, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Bulwer, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Caledonia, Dak.	3.00	.....	3.20	3 00	....	....	3.25	....	....	....	....	....	900
Calumet & Hecla	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Challar, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Chrysolite, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Colorado Cent'l, Colo.	....	.....	....	....	2 15	....	....	....	....	....	....	....	600
Cons. Cal. & Va., Nev.	11.50	.....	11.00	....	11.63	10 88	10 50	....	10.38	....	10 38	10.25	1,295
Crown Point, Nev	8 25	.....	8.13	....	....	....	....	....	....	....	....	....	551
Deadwood, Dak.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Dunkin, Colo.	....	.....	.97	....	....	....	....	....	....	....	....	....	100
Eureka Cons., Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Father de Smet, Dak	....	.....	....	....	....	....	....	....	....	....	.45	....	300
Freeland, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Gould & Curry, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Grand Prize, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Hale & Norcross, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Holyoke, Idaho	....	.....	....	....	....	....	....	....	.06	....	....	....	400
Homestake, Dak.	....	.....	....	....	12.00	....	....	....	....	....	....	....	100
Horn-Silver, Ut.	....	.....	.90	....	....	....	....	....	....	....	....	....	200
Iron Hill, Dak.	....	.....	....	....	....	....	.10	....	....	....	....	....	200
Iron Silver, Colo.	....	.....	8 35	....	....	....	....	....	....	....	....	....	700
Leadville C., Colo.	.10	.....	.11	....	....	....	....	....	....	....	....	....	400
Little Chief, Colo.	.22	.....	.22	....	.22	....	....	....	....	....	....	....	1,200
Little Pittsburg, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Martin White, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Mono, Cal	....	.....	....	....	1.80	....	....	....	....	....	....	....	200
Mount Diablo, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Navajo, Nev.	....	.....	....	....	2 60	2.55	....	....	....	....	....	....	200
North Belle Isle, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
North Star, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Ontario, Ut.	....	....	33.00	....	....	....	33 50	....	....	....	32 75	....	230
Ophir, Nev.	....	.....	....	....	8 38	....	....	....	....	....	....	....	100
Plutus, Colo.	.98	.....	.98	....	99	.95	.90	.85	.97	....	.85	....	3,400
Plymouth, Cal.	....	.....	....	....	....	....	9 50	9.00	9 13	8 25	8.88	8.25	1,440
Quicksilver Pref., Cal	....	.....	37.00	....	38.00	....	37.50	37.38	37 63	37.00	....	....	1,000
" Com., Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Robinson Cons. Colo.	....	.....	....	....	.75	....	.75	....	....	....	....	....	100
Savage, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Sierra Nevada, Nev.	....	.....	....	....	4.75	....	....	....	....	....	....	....	200
Silver King, Ariz.	1 60	.....	1.65	1 50	1.55	1.40	1.50	1.40	1 40	1.25	1.30	1.20	6,600
Silver Mg. of L. V.	.28	.27	....	....	....	....	....	....	....	....	....	....	1,500
Small Hopes, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Standard, Cal	....	.....	....	....	1 60	....	....	....	....	....	....	....	200
Stormont, Utah	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Yellow Jacket	....	.....	....	....	7 00	....	....	....	6.00	....	....	....	300

NON-DIVIDEND-PAYING MINES

Name and Location of Company.	Nov. 10. H.	Nov. 10. L.	Nov. 12 H.	Nov. 12 L.	Nov. 13. H.	Nov. 13. L.	Nov. 14. H.	Nov. 14. L.	Nov. 15. H.	Nov. 15. L.	Nov. 16. H.	Nov. 16. L.	Sales
Alta, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Amador, Cal.	2.25	....	2.25	....	2.25	....	2.25	....	....	....	2.25	....	2,800
Am'can Flag, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Astoria, Cal.	.24	....	.24	....	.25	.24	.26	.24	.25	.24	.25	.24	7,900
Barcelona, Nev.	....	.....	.66	....	....	....	.67	.65	....	....	.75	....	500
Bechtel, Cal.	....	.....	....	....	.10	....	....	....	....	....	....	....	100
Best & Belcher, Nev.	9 50	....	....	....	....	....	....	....	....	....	....	....	100
Brunswick, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Buffalo Iron Min'g.	6.25	6.00	6.25	6.00	6.38	6.13	6.25	6.00	6.25	6.00	6 25	6.00	3,800
Bullion, Nev.	2.15	....	....	....	....	....	....	....	....	....	2.10	....	300
Cashier, Colo	....	.....	.11	....	.10	....	....	....	....	....	....	....	1,100
Castle Creek, Id.	....	.....	....	....	....	....	....	....	....	....	....	....	500
Central Arizona	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Cleveland, Dak.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Colchis, N. M.	2.10	....	2.20	2.05	2.15	2.05	2.10	2.05	2.10	2.00	2.05	....	1,400
Columbia & Beaver	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Con. Imperial, Nev	1.10	....	....	....	1.10	....	....	....	.95	....	....	....	2,100
Con Pacific	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Eastern Oregon	....	.....	....	....	....	....	....	....	....	....	....	....	.....
El Cristo, U. S. Col.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Exchequer, Nev.	....	.....	2 00	....	2.00	....	1.95	....	1.90	....	1.85	....	700
Found Treas'e, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Hollywood, Cal.	.40	....	.40	....	.40	....	.41	....	.41	.40	.41	....	4,700
Huron, Mich.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Julia, Nev.	.55	....	.50	....	.50	....	.50	....	.50	....	.50	....	1,000
Kingst'n & Pemb'ke	....	....	1 25	1.00	1.00	....	....	....	....	....	....	....	5,700
Kossuth, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Lacrosse, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Lee Basin, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Mexican, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Middle Bar, Cal.	.43	....	.43	....	.44	....	.43	....	.42	....	.42	....	3,200
Moniter, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
N'th Standard, Cal	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Oriental & Miller.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix Lead, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix of Ark.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Rappahann'k, Va.	.10	....	.10	....	.10	....	.10	....	.10	....	.10	....	5,2 0
San Sebastian, S'nS	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Santiago, U. S. Col.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Shoshone, Idaho	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver Cliff, Colo	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver Cord, Colo.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen, Ariz.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
State Line 1&4, Nev	....	.....	....	....	....	....	....	....	....	....	....	....	.....
" 2&3, "	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Sutro Tunnel, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
" Trust Cert.	.64	....	.66	....	.66	....	.68	.66	.68	.67	.67	....	7,200
Sutter Creek, Cal.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Sylvanite M. & M. Col	3.10	....	....	....	....	....	....	....	....	....	....	....	200
Tornado, Nev.	....	.....	....	....	....	....	....	....	....	....	....	....	.....
Union Cons., Nev.	4.55	....	....	....	....	....	....	....	....	....	3 80	....	400
United Copper	.55	....	.55	.50	.60	.60	.60	.55	.55	.50	.75	....	3,600

*Ex. dividend. †Dealt in at the New York Stock Ex. Unlisted Securities ‡Assessment unpaid. Dividend shares sold, 23,022. Non-dividend shares sold, 54,800. Total New York, 77,822

BOSTON MINING STOCK QUOTATIONS.

Name of Company	Nov. 9.		Nov. 10.		Nov. 12.		Nov. 13.*		Nov. 14		Nov. 15.		Sales.
Atlantic, Mich.	20.00	.....	.....	.....	.....	.....	.....	.....	19.00	.....	.....	.....	115
Bodie, Cal.	.....	.....	1.75	1.56	1.63	.....	.....	.....	1.63	.....	1.56	.....	350
Bonanza Developm't	.....	.....	70.00	.....	70.00	69.75	.....	.....	73.00	70.00	71.00	73.00	418
Bost. & Mont., Copper	70.50	69.00	.30	.....	32½	.....	.....	.....	.....	.....	.....	.....	300
Breece, Colo	.....	.....	314¼	314	.....	.....	.....	.....	315	313	314	.....	160
Calumet & Hecla	319	318	.....	.....	19	.....	.....	.....	.....	.....	.19	.....	1,000
Catalpa, Colo.	.19	.....	.19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Chrysolite, Colo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Con. Cal. & Va., Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo.	.95	.....	.95	.91	.95	.....	.....	.....	.....	.....	.95	.91	1,100
Enterprise	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, Mich.	19.00	.....	19.00	.....	19.00	.....	.....	.....	18 00	.....	18 00	.....	300
Hale & Norcross, Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine, Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.70	.....	1,200
Little Chief, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Pittsburg, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Martin White, Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa, Cal.	2.00	.....	.....	.....	2.00	.....	.....	.....	.....	.....	2.00	.....	200
Ontario	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Osceola, Mich	22.50	22.00	.....	.....	22.25	22.00	.....	.....	21 63	.....	.....	.....	153
Pewabic, Mich.	5.50	.....	5.38	.....	5.25	.....	.....	.....	5.50	.....	5.50	.....	350
Quincy, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.86	.....	.....	.....	10
Ridge, Mich.	1.75	1.63	.....	.....	1.75	1.50	.....	.....	.....	.....	2.13	2.00	1,350
Sierra Nev., Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack, Mich.	180	.....	.....	.....	180	.....	.....	.....	178	.....	.....	.....	29

Name of Company.	Nov. 9.		Nov. 10.		Nov. 12.		Nov. 13*		Nov. 14.		Nov. 15.		Sales
Allouez, Mich.	5.50	5.44	5.44	5.38	5.50	5.38	...	...	5.13	5.00	5.13	5.00	1,490
Arnold, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Astec, Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.15	.....	100
Brunswick, Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Butte & Boston	30.00	29 50	29.50	29.00	29.50	29.00	.....	.....	29.00	.....	29.25	29 00	1,564
Canada	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, Colo.	.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Cusi, N. Mex.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.7	.....	100
Denver City, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Everett	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hanover, Mich	.....	.....	.....	.....	.20	.....	.....	.....	.....	.....	.....	.....	100
Humboldt, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hungarian	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huron, Mich	.....	.....	7.25	7.00	7.13	7 00	.....	.....	.....	.....	7.00	.....	600
Kearsarge, Mich.	13.25	13.00	13.00	.....	13 00	.....	.....	.....	.....	.....	13.00	.....	705
Mesnard, Mich.	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
National, Mich.	8.50	8.00	8.25	8.00	8.50	8.13	.....	.....	8.00	.....	.....	.....	945
Native, Mich.	.....	.....	.15	.....	.....	.....	.....	.....	.....	.....	.....	.....	300
Oriental & M., Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pontiac	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rockland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security, Colo	03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Shoshone, Idaho	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Side, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St Louis Cop.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Mary's	.27½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Washington	.....	.....	.....	.....	.25	.....	.....	.....	.....	.....	.30	.....	300
Winthrop, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*By an accident we were unable to get the quotations for this day. Boston: Dividend shares sold, 7,635. Non-dividend shares sold, 6,804. Total Boston, 14,439.

COAL STOCKS.

Name of Company.	Par val. of sh'rs.	Nov. 10. H.	Nov. 10. L.	Nov. 12. H.	Nov. 12. L.	Nov. 13. H.	Nov. 13. L.	Nov. 14 H.	Nov. 14 L.	Nov. 15. H.	Nov. 15. L.	Nov. 16 H.	Nov. 16 L.	Sales.
American Coal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65
Barclay Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cameron Coal & Iron Co	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chic. & Ind. Coal RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....
Do. pref.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	.....	.....	.....	.....	.....	.....	21⅞	21⅝	.....	.....	.....	.....	200
Col., C. & I	100	35	34½	34¼	34⅛	34	.....	34⅛	34¼	.....	.....	.....	.....	900
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C.	100	118¾	.....	119¼	118⅝	118½	118	118½	118	118¾	.....	118⅞	.....	2,381
D., L. & W. RR.	50	138⅜	137¾	138⅜	137½	137	135⅝	136¾	135¾	137⅝	136⅜	137⅝	136½	87,562
Hocking Valley	100	.....	.....	27	26½	26	25¾	27	26⅛	27	.....	26	.....	1,000
Hunt. & Broad Top	.....	.....	.....	.....	.....	20	.....	.....	.....	.....	.....	.....	.....	100
Do. pref. & Int.	.....	46	.....	.....	.....	46	.....	46¾	.....	46¼	.....	.....	.....	406
Lehigh C. & N.	50	51¼	.....	51⅜	51¼	.....	.....	51⅛	51¼	51⅜	51¼	.....	.....	623
Lehigh & W. B. Coal	.....	30	29	.....	.....	.....	.....	29	.....	.....	.....	.....	.....	487
Lehigh Valley RR.	50	53⅞	53¾	53⅜	53¾	53¾	53½	53⅝	.....	53¾	.....	.....	.....	985
Mahoning Coal RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montauk Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	100	143¾	.....	.....	.....	.....	.....	143½	.....	.....	.....	.....	.....	64
New Central Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. J. C. RR.	50	90¾	90⅛	90¾	90⅛	90	89½	90¾	89⅝	91⅛	90¼	91¼	90¾	6,445
N. Y. & S. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	.....	.....	9¼	.....	9¼	9⅛	9¼	9	9¼	.....	.....	.....	1,340
Do. pref.	100	33	32½	33¼	33	32¾	.....	33	32⅝	33¼	33⅛	.....	.....	1,860
N. Y. & Perry C. & I.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western R.R.	100	.....	.....	18	17⅝	17⅛	.....	.....	.....	.....	.....	.....	.....	320
Do. pref.	50	52¼	51¾	51¾	.....	51⅛	50¼	51¼	50¼	51	50¼	50¾	49⅝	7,805
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.	50	53⅜	.....	53⅜	53⅜	53⅜	.....	53¼	52⅝	53¼	53	.....	.....	11,210
Ph. & R. RR.**	50	49⅜	48⅞	49¼	48⅛	48	47	48¼	47⅛	48⅝	47⅞	48⅞	47¾	313,343
Tennessee C. & I. Co.	100	35⅝	35	36½	35¼	36	34¼	36½	35	35⅝	35⅝	35⅞	35	21,032
Do. Pref.	.....	95½	.....	96	95	94¾	.....	95½	.....	.....	.....	95¼	.....	787
Westmoreland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wyoming Valley Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	*86	.....	.....	.....	.....

*Bid. †Asked.
**Of the sales of this stock, 46,448 were in Philadelphia, and 296,895 in New York. Total sales, 488,850.

San Francisco Mining Stock Quotations.

Company.	Closing Quotations. Nov. 9.	Nov. 10.	Nov. 12.	Nov. 13.	Nov. 14.	Nov. 15.
Alpha	.....	.....	.....	.....	.....	.....
Alta	3.60	3.55	3.65	3.45	3.15	3.20
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.45	.....	.40	.....	.....	.....
Best & Bel.	9.38	8.75	9.25	9.50	9.00	8.38
Bodie	2.30	.....	2.20	2.10	2.00	1.80
Bulwer	.....	.70	.....	.....	.....	.65
Challar	4.50	4.60	4.75	4.60	4.10	4.00
C'm'weal'h	.....	.....	.....	3.80	3.90	3.80
Con. C. & V	11.38	11.25	10.75	10.75	10.13	10.10
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	8.00	7.88	7.85	7.75	6.63	6.50
Eureka C.	.....	.....	.....	.....	.....	.....
Gould & C.	5.63	5.38	5.63	5.63	5.25	5.00
Grd. Prize.	.....	.....	.....	.....	.....	.....
Hale & N.	6.50	6.38	6.63	6.63	6.13	6.00
Mexican	5.63	5.38	5.50	5.38	5.00	4.85
Mono	1.75	.....	.....	1.55	1.75	1.30
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	2.50	.....	2.60	2.55	.....	2.35
Nev. Queen	2.95	.....	2.95	2.90	2.90	2.95
N. Belle I.	2.30	2.30	2.30	2.40	.....	2.35
Ophir	8.25	8 00	8.12	8 13	7.50	7.50
Potosi	4.45	4 55	4.65	4.40	4.10	3.80
Savage	5.13	5.38	5.62	5.38	5.00	4.85
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nev	4.65	4.45	4.60	4.55	4.30	4.00
Sutro Tun.	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....
Union Con.	4.70	4 40	4.60	4.40	4.15	4.00
Utah	1.85	1.75	1 90	1.90	1.75	1.70
Yellow Jkt.	7.00	7.13	6.75	6.63	6.00	5.75

the prices ranged at from $6@$6.38, selling to-day at from $6@$6.25.

Caledonia was firm at from $3@$3.25. Homestake has just declared its usual monthly dividend, shows one sale at $12, and Iron Hill one at 10c.

Holyoke is selling at 6c., and Castle Creek at 5c.

There is little or nothing doing in the Bodies. Bodie Consolidated is selling at $2@$2.05, Mono at $1.80, and Standard at $1.60.

Brunswick is neglected.

Plymouth Consolidated opened at $9.50 and declined to $8.25.

Quicksilver Preferred was quite active, selling at from $37@$38. Common was neglected.

The prices of the Amador stocks remain firm. Amador continues at $2.25, Astoria at 24@25c., Hollywood at 40@41c., Middle Bar at from 42@44c.

Sylvanite is quiet; one sale is reported at $3.10. Cashier at 10@11c.; Robinson Consolidated at 75c. There was considerable business in Plutus, which declined from 99c. to 85c. Little Chief sold at 22c., Leadville at 10@11c., Iron Silver at $3.35, Dunkin at 97c.

Kingston & Pembroke was firm at from $1 to $1 25.

Quite a large business was done in Colchis, which ruled steady at from $2 to $2.20. Silver Mining of Lake Valley was dealt in only on Saturday at 27@28c.

United Copper, which last week declined from $1.25 to 50c., sold this week at from 50 to 65c.

For the present no attention is devoted to El Cristo. A few sales were made this week at prices varying from 68 to 60c.

Application has been made to the Consolidated Stock and Petroleum Exchange to list the stock of the Sullivan Consolidated Gold Mining Company, of Dakota. This company was incorporated under the laws of New Hampshire, September 18th, 1888. The capital stock $600,000, shares $3 each, assessable. The officers of the company are Geo. E. Garrington, President; Geo. W. McKinney, Vice-President; Chester M. Sprague, Secretary and Treasurer. The above officers, together with A. P. Kidder, Fernando J. Ayer, John T. Hooper and H. L. Peck, constitute the Board of Directors. The principal office is at 27 Doane street, Boston, Mass. The property is located in Pennington County, and comprises the following claims: Sullivan, Beaver, Elgin, Volunteer, Almont, Tariff, Revenue, Eclipse, Astor and Hoosac, or, as the application expresses it, "forty acres of gold placers with water rights." This stock has been dealt in for some time past at the Boston Stock Exchange.

A note drawn by Moore, Benjamin & Co., the exbonanza iron kings of the Gogebic range, amounting to $10,000, was sold in Milwaukee recently for $10.

There is no change in the price of Rappahannock, which remains at 10c.

There is nothing doing in Horn-Silver, which is quoted at 90c. Ontario holds its own at from $32.75 to $33.50.

Auction Sale of Stocks.

At the Real Estate Exchange, on the 14th inst., the following stock was sold at auction: 500 shares of the Victoria Gold Mining Company, of Colorado, of the par value of $10, at $8 each; 100 shares Lehigh & Wilkesbarre Coal Company, at $28; 354 shares Pennsylvania Coal Company, at $291; 100 shares Consolidated Coal Company, of Maryland, at $25.

Electric Stock Quotations.

The following are the latest obtainable quotations, prepared for the ENGINEERING AND MINING JOURNAL by Messrs. Crosman & Quick, brokers, New York City, under date of the 15th inst.: Edison, $118@$123; Edison Illuminating, $84@$85½; Consolidated, $50@$55; Westinghouse, $29@$30; Brush, $80@$100; Brush Illuminating, $35@$45; United States, $30@$40; U. S. Illuminating, $50@$60; Daft, $40@$60.

Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, report for the week as follows:

The petroleum market is utterly devoid of all interest, and transactions are so limited as to afford no basis or calculations as to its immediate course. The outlook for the field is a slight increase in production, but the consumption is so much in excess of production, that the stock of oil above ground, which is now only nineteen millions of barrels, is likely to be considerably reduced during the coming winter. There being only a relatively small amount of oil on top of ground, a good deal of which must necessarily be held by the Standard Oil Company, is a reason for supposing that a deal will be inaugurated in it sooner or later, as there is no other illuminant equally portable and cheap, to take its place. Ohio oil, of course, is a threatening factor in the general situation, because there is a constant apprehension that its crude product can be converted into a refined oil to compete with the Pennsylvania product. So far there has been no successful method discovered, as far as we know. Taken altogether, we are unable to advise in regard to the immediate course of prices, but upon any radical break from the present price we should think the market would be a purchase.

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Nov. 10.....	85¾	86	85¼	85¼	285,000
12.....	85⅛	86¼	84⅞	85⅝	1,108,000
13.....	86⅛	87¼	86¼	86⅞	1,021,000
14.....	86⅞	86¾	85½	85⅝	878,000
15.....	85½	86¼	85¼	85½	798,000
16.....	85⅝	85⅞	84¾	85	413,000
Total sales in barrels.....					4,503,000

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Nov. 10.....	85¾	85¾	85¼	85¼	462,000
12.....	85⅝	86⅞	85⅛	86⅛	846,000
13.....	86½	87¼	86⅛	86½	542,000
14.....	86¾	86¾	85⅝	85⅝	483,000
15.....	85⅝	86⅞	85¼	85¼	602,000
16.....	85¼	85¾	84⅞	85	604,000
Total sales in barrels.....					3,539,000

Dividends.

The following have been declared:

Aspen Mining and Smelting Company, of Colorado, dividend No. 1, twenty cents per share, or $40,000, payable November 17th at No. 54 Wall street, New York City.

Consolidated Kansas City Smelting and Refining Company, quarterly, No. 6, 2½ per cent, payable November 25th in Kansas City, Mo.

Homestake Mining Company, of Dakota, dividend No. 124, twenty cents per share, or $25,000, payable November 26th at No. 15 Broad street, N. Y. City.

New York & Honduras Rosario Mining Company, of Honduras, ten cents per share, payable November 22d at Rooms 347-349 Produce Exchange, New York City.,

Parrott Silver and Copper Company, of Montana, paid quarterly dividend, twenty cents per share, or $36,000, November 1st.

Philadelphia (natural gas) Company, of Pennsylvania, dividend No. 37, one per cent, or $75,000, payable November 25th, at No. 820 Penn avenue, Pittsburg, Pa.

Standard Oil Trust, quarterly, three per cent.

Assessments.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of Sale.	Amn't per share.
Alpha, Nev.....	24	Nov. 3	Dec. 8	Dec. 28	.87½
Alpha Cons., Nev...	2	Nov. 3	Dec. 8	Dec. 28	.25
Alta, Nev.....	38	Sept. 28	Nov. 5	Nov. 26	.50
Anchor, Utah.....	8	Sept. 28	Nov. 3	Nov. 20	.10
Andes, Nev.....	34	Oct. 5	Nov. 12	Dec. 3	.25
Bear Butte, Dak.....	3	Oct. 22	Nov. 30	Dec. 17	.002½
Benton Cons., Nev..	18	Oct. 29	Dec. 3	Dec. 24	1.00
Best & Belcher, Nev.	41	Oct. 16	Nov. 21	Dec. 11	.25
Blue Bird, Dak.....	3	Oct. 25	Nov. 26	Dec. 17	.001
Bodie, Cal.....	9	Sept. 24	Oct. 29	Nov. 30	.50
Caledonia, Nev.....	43	Oct. 19	Nov. 21	Dec. 12	.15
Chollar, Nev.....	26	Oct. 8	Nov. 13	Dec. 5	.50
Crown Point, Nev ..	50	Oct. 2	Nov. 5	Nov. 26	.50
Cons. Imperial, Nev.	25	Oct. 16	Nov. 21	Dec. 12	.05
Del. Monte, Nev.....	1	Oct. 15	Nov. 20	Dec. 12	.25
Found Treasure, Nv.	4	Oct. 25	Nov. 30	Dec. 21	.06
Garden City, Dak...	2	Nov. 3	Dec. 3	Dec. 18	.001
General Crook, Dak.	5	Oct. 12	Dec. 1	Dec. 20	.002
Gibraltar Cons., Cal.	23	Oct. 19	Nov. 19	Dec. 1	.30
Golden Reward, Dak.	3	Oct. 14	Nov. 21	Dec. 8	.02
Gould & Curry, Nev	60	Oct. 4	Nov. 9	Nov. 30	.30
Grand Prize, Nev...	19	Oct. 12	Nov. 17	Dec. 5	.25
Horseshoe Bar Cons., Cal.....	1	Oct. 9	Nov. 17	Dec. 10	.25
Justice, Nev.....	47	Sept. 25	Oct. 31	Nov. 19	.25
Keyes, Nev.....	3	Oct. 22	Nov. 24	Dec. 15	.25
Mikado, Dak.....	1	Sept. 25	Oct. 27	Nov. 17	.002
Montrose, Colo.....	1	Oct. 3	Nov. 12	Dec. 15	.01½
Mono, Cal.....	26	Sept. 20	Oct. 23	Nov. 28	.50
Mayflower, Nev.....	43	Oct. 16	Nov. 16	Dec. 10	.50
North Belle Isle, Nv.	13	Oct. 23	Nov. 27	Dec. 19	.50
N. Commonw'lth, Nv.	1	Oct. 15	Nov. 19	Dec. 11	.30
Overland, Idaho.....	..	Nov. 1	Dec. 10	Dec. 31	.30
Potosi.....	31	Oct. 1	Nov. 6	Nov. 27	.50
Ross Hannibal, Dak.	3	Sept. 25	Oct. 27	Nov. 17	.002
Russell, Cal.....	3	Oct. 18	Nov. 26	Dec. 17	.10
Ruby Hill, Nev.....	16	Sept. 21	Oct. 20	Nov. 20	.01
San Luis, Cons., Cal.	20	Oct. 17	Nov. 17	Dec. 1	.00108
Savage, Nev.....	71	Oct. 4	Nov. 7	Nov. 27	.50
Seabury Calkins, Dak.....	10	Oct. 15	Nov. 20	Dec. 10	.06¾
Silver King, Dak....	1	Nov. 2	Dec. 3	Dec. 18	.001
Spruce Gulch, Dak..	3	Sept. 19	*No. 15	*Dec. 3	.001
Troy, Dak.....	2	Nov. 1	Dec. 6	Dec. 22	.002
Tuscarora, Nev.....	1	Oct. 1	Nov. 4	Dec. 5	.05
Utah, Nev.....	5	Oct. 4	Nov. 8	Nov. 26	.25
Wall St., Dak.....	1	Sept. 20	*No. 13	*Dec. 10	.001½

*Delinquent day and day of sale postponed to dates given above.

FINANCIAL STATEMENTS.

The following are the financial balances of the various mining companies on November 1st:

CASH ON HAND.

Alpha Con.....	$3,169.89	Independence	$3,414.91
Alta.....	26,913.65	Julia.....	503.08
Andes.....	2,003.79	Lady Washingt'n.	25,218.67
Belcher.....	26,014.81	Locomotive	3,668.12
Belle Isle.....	777.52	Mexican.....	17,594.18
Best & Belcher..	951.72	Mono.....	24,227.75
Bodie.....	38,222.15	Occidental.....	1,055.90
Bullion.....	45,146.64	Ophir.....	35,475.33
Bulwer.....	13,137.35	Overman.....	18,349.70
Caledonia.....	5.70	Poudere.....	290.52
*Con. Cal. & Va..	114,461.43	Sierra Nevada....	9,800.18
Cons. Imperial...	1,633.89	Silver Hill.....	13,045.08
Confidence.....	31,768.88	Standard.....	16,620.34
Diana.....	4,815.85	Syndicate.....	9,404.43
Dudley.....	383.16	Summit.....	93.08
Exchequer.....	19,339.05	Tioga Cons.....	1,180.87
Found Treasure..	360.19	Union Cons.....	965.89
Hale & Norcross.	14,831.30	Utah Cons.....	965.89
Holmes.....	820.11		

*In cash and unsold bullion, the assay value of which is $77,884.34, with the closing shipment on October account to be received.

INDEBTEDNESS.

Benton Cons.....	25,000	North Commonwealth.....	$22,006.78
Challenge.....	3,604.43	North Belle Isle..	51,160.81
Chollar.....	39,871.61	Nevada Queen...	27,409.52
*Crown Pt.....	25,352.02	Potosi.....	42,702.10
Del Monte.....	15,172.41	Savage.....	79,775.18
Gould & Curry...	8,032.44	Seg. Belcher.....	20,910.79
Grand Prize.....	42,787.06		
Navajo.....	15,487.50		

*With a balance of $46,086 to be collected on the pending assessment.

Boston Mining Stocks. Nov. 15.

[From our Special Correspondent.]

The market for copper stocks the past week has sympathized with the general stock market, and transactions have, except in a few instances, been rather limited. The feature of the market has been the large transactions in Boston & Montana, and the decline in the stock to $69 in the early dealings, followed by a sharp reaction yesterday and to-day to $73½@$74, some 4000 shares being marketed from $70 up to $74. It is said that large orders from New York to buy the stock is the cause of the advance. The new favorite, Butte & Boston, sold up to $30, but declined subsequently to $28, closing a little stronger at $29. About 1300 shares were dealt in.

Calumet & Hecla sold ex-dividend of $5 at $314.50 @$315, with last sales at $314, not much change from last week. The balance of the list declined from 50c. to $4 per share, with rather more disposition to sell than to purchase. We are inclined to think, however, that the market will improve from now on, and that as soon as the copper syndicate have fixed things to their liking and secured the extension of their contracts that a veritable boom will be started, which will carry prices a great deal higher than we have had yet. Franklin declined from $19 to $18, Atlantic from $20⅝ to $19, Osceola from $22½ to $21⅝, Tamarack from $180 to $176, with later sales at $178, Quincy from $87 to $85, Allouez from $5½ to $5, National from $8¼ to $8, Huron from $7¼ to $7, Ridge from $2 to $1½, with a rally later to $2. Pewabic held its own at $5½. Bonanza declined from $1¼ to $1⅛. Silver stocks dull, with sales of Dunkin at 95c. and Napa Quicksilver at $2.

LATER PRICES.

(*By Telegraph.*)- November 16th, 1 P.M.—Calumet & Hecla, $314; Boston & Montana, $73½; Kearsarge advanced to $13⅝; National, $8¼; Butte & Boston, $29; Tamarack, $177 bid; Quincy, $86.

St. Louis Mining Stocks. Nov. 14.

[From our Special Correspondent.]

The halcyon days of the promoter of wild cat mining schemes in St. Louis are long since past. The suckers have nearly all been caught, and though you may occasionally come across a credulous individual ready to accept as gospel truth the representations of some Westerner who has a mine for sale with millions in sight and the dump fairly covered with gold and silver; still they are by no means as numerous as they were a couple of years ago when the fever first caught. Our people here were badly taken in—there is no use denying it—but their mistakes have taught them caution, and all their recent investments in mines have been governed by a sound and conservative policy.

There is no doubt but that St. Louis is destined to become the mining center of the United States; she is interested in many properties that, with careful management and proper development, will surely come to the front as dividend payers, besides having as a constant stimulus to her mining industry the Granite Mountain, one of the greatest mines in the world. With its earlier history your readers are familiar, but its recent report, just published, will be of interest. During the fiscal year ending July 31st, 1888, $2,200,000 have been returned to stockholders in dividends, making an aggregate of $5,300,000, or 13.25 per share, paid from April 18th, 1885, to date. The total gross product of the property to July 31st, 1888, has been 7,606,515 ounces of fine silver, 3185 ounces of fine gold, and 537 tons of ore shipped to smelter, from all of which $7,776,340 have been realized. To July 31st the expenditures were as follows:

For mills, buildings, roads and other permanent improvements, lands, ranches, and lode claims and water rights, say.....	$502,500
For unconsumed supplies, as per inventory....	185,000
For labor and supplies consumed, say.....	1,464,264
For bullion and smelting ore, freight, and refining charges, say.....	214.167
For miscellaneous expenses, including home department, say.....	108,000
For 43 dividends returned to stockholders	4,800,000
Total disbursements, say.....	$7,363,931
Cash on hand in St. Louis and in Montana, and bullion en route and sold, July 31st.....	412,409

From the above it will be seen that the dividends returned to stockholders are about 62 per cent of the gross output, leaving as an extra asset the value of the plant and unconsumed supplies, which were taken in inventory July 31st at $581,579. This is certainly a most favorable showing, but better results may be looked for in the spring, when the new 90-stamp mill will be in operation. However, it is intended to utilize in the three mills (aggregating 160 stamps) a larger proportion of low-grade ore than heretofore, and hence the increased output of bullion will not be in proportion to the increased milling capacity. By second class or low grade ore is meant ore assaying under 75 ounces per ton, of which there are immense quantities.

In the face of this report there is a good inquiry for the stock, notably for small lots, of from 10 to 50 shares. There is no mine better managed, no company whose board of directors and officers are more efficient, more able and more careful of its interests, and no stock on this market, or any other, in which the insiders and larger holders have shown so little disposition to manipulate than the Granite Mountain.

The general market has been quiet, though some of the cheaper stocks have at times displayed a good deal of activity.